NATIONAL PETROLEUM NEWS

Vol. XVIII Cleveland, Ohio, December 8, 1926 No. 49

Herndon Urges Oil Industry to Work Out Its Own Conservation Program

Staff Special

TULSA, Dec. 7

PRACTICAL conservation of the nation's oil resources by cooperative action within the oil industry itself to correct untimely and uneconomic production of oil is in the forefront of the minds of many of the oil men present at the seventh annual meeting of the American Petroleum Institute, which opened here today.

That institute directors will have submitted to them the suggestion of Mark L. Requa, head of the oil division of the fuel administration during the war, that the institute find some means of regulating production through cooperative action of oil companies seemed certain as the meeting opened.

Two directors said they agreed with Mr. Requa in the main and that they intended to bring his suggestion to the attention of the directors' meeting tomorrow. These directors said they were not in favor of asking for either national or state legislation which would allow agreement among oil companies to hold back production but that they thought a good deal could be accomplished without legislation by the oil companies themselves directed through the institute.

Today these same men heard, at the Institute opening general session, C. C. Herndon, vice-president and counsel of the Skelly Oil Co., voice the opinion that true conservation can and will be accomplished by the oil industry itself through the same kind of cooperative action that led to the formation of the American Petroleum Institute and has made it a force in the industry.

Relief in Cooperation

HE cited two main phases of conservation, general use of scientific methods for obtaining greater recovery of oil from the sands and prevention of overproduction from flush fields, as possible to accomplish by cooperative development. His topic was "Cooperation in the Oil Industry."

He traced the development of a spirit of cooperation among oil men from its birth after the dissolution of the Standard Oil Co. in 1911 to its climax when the leading oil men of the country, Standard and Independent alike, gathered in the nation's service around the table of the American Petroleum War Service Committee. He pointed out the triumph of cooperation represented by the working out by the Institute of the program of standardization of oil field equipment, and suggested that the same spirit could be turned toward the solution of the problem of conservation. In speaking of this, he said:

"Conservation is another great province of cooperative endeavor, and here again is an objective which cannot be attained without strong cooperative impulse. In the practice of conservation we are standing at the threshold of a new era. The Federal Oil Conservation Board and the institute, working harmoniously, are pointing the way.

Touches Industry Frequently

"CONSERVATION touches the operations of our industry at many points. One of its most interesting applications can be observed in the scientific evolution of methods of increasing the recovery of oil from producing sands. These new methods will render archaic in 10 years our present expectations of oil recovery."

The American Petroleum Institute, in the minds of many oil men, is the agency through which the oil industry may well function to effect real conservation measures, Secretary Hoover of the Department of Commerce had pointed out, Mr. Herndon said.

Realizing that the Sherman anti-trust law and the laws of various states as they now stand might prove a barrier to the fullest cooperation among oil men to bring about conservation by preventing too rapid production of oil from flush fields when the oil was not needed and served only to glut the market, Mr. Herndon said that here too Secretary Hoover has pointed a possible way out of such difficulties.

Going on to discuss conservation by cooperation, Mr. Herndon said:

"In an opposite way, overproduction is related to conservation and here also constructive thought may be expected from the Institute and the Federal Oil Conservation Board. Secretary Hoover's statement on this topic during his recent visit to Tulsa was significant.

Hoover Has Suggestion

WITH the authority of a member of the President's cabinet and a member of the Federal Oil Conservation Board, the secretary marked out a line of action for the industry to follow toward the solution of its recurrent problem—overproduction. He said, 'You have the annual meeting of the American Petroleum Institute coming to your city in December and, if members of this body can get together and formulate some plan regarding modification of the Sherman anti-trust act as applied to drilling flush fields, and properly present this plan, I see no reason why it should not receive favorable action at the hands of congress.'

"The suggestion of the secretary will doubtless receive at this meeting of the Institute the attention which its importance warrants."

The speaker pointed to the recent shutdown program at Seminole as an

Text of Mr. Herndon's paper and his creed for the oil industry are published on page 52-53. Other papers read before the A.P.I. are published beginning on page 44.

example of what can be accomplished through voluntary cooperation among oil producers. He said:

"A case fresh in our minds demonstrates the reality of cooperative conservation. In the new Seminole field in Oklahoma where wells of spectacular size are completed in rapid succession, there existed recently a condition of acute local congestion which threatened the equilibrium of the whole industry. Operators in that field held a series of earnest meetings and agreed upon a plan to control and restrict production. This cooperative and self-imposed restraint has moral as well as physical value and renews faith in our capacity for self-government.

"The removal, with due safeguards against abuse, of limitations which federal and state laws now impose on this form of cooperation would make it possible to deal even more effectively with such situations which, as Secretary Hoover said, although apparently local to particular fields, may threaten to upset the condition of the entire country. In the direction of the needed liberalization of the law, Mr. Hoover has plainly pointed the way."

Mr. Herndon closed his address with the following words: "I say again that the reality of our cooperative consciousness will be the touchstone of our industrial statesmanship."

Favor Uniform Accounting

ANOTHER important accomplishment of the institute which probably will be approved for general use in the oil industry, is the uniform accounting methods. The general balance sheet will be submitted to the directors and if approved is ready for adoption by oil companies. Work of drafting a uniform accounting method has been carried on for two years under the direction of M. W. Mattison.

The balance sheet has been in tentative form a year and has been only slightly modified. The importance of this work is to be seen in the fact that, through the institute, stock exchanges and banks which finance oil companies will be asked to require that oil companies with which they deal render their financial statements in accordance with the method worked out by the institute. It is believed this will go far toward making it impossible for companies of a certain type to render misleading financial statements, as has been done in the past.

Standardization Reports

MEETINGS of many of the standardization committees, particularly those whose original programs have been almost completed, were taken up Monday with discussion of minor details of administration.

The committee on cable tool drilling joints heard a report by Thomas Fleming, Jr., vice-president, Oil Well Supply Co., to the effect that gratifying progress is being made by manufacturers in introducing the A. P. I. joints. The committee voted to gather information from various fields on proper care and use of the joints. G. H. Jaques, Midwest Refining Co., heads this committee.

The committee on production equipment largely concerned at this time with the attempt to work out a standard method of rating horse power of gas engines.

Ralph J. Reed, chief engineer, Union Oil Co. of California, was elected national chairman of the committee on standardization of oil steel storage and production tanks, succeeding G. M. Vanderveer, Midwest Refining Co.

It was pointed out by G. O. Wilson, Standard Oil Co. of California, and Ralph Reed that tank specifications submitted had been made up and concurred in by virtually all the larger oil companies in California, and that they also had approval of tank manufacturers there.

The specifications include five tanks having following capacities in barrels: 10,000, 18,000, 31,000, 49,000 and 82,000. The largest tank has a diameter of 120 feet and height of 40 feet 9 inches. The specifications except for minor changes were adopted and will be submitted to the industry for further action.

The committee on oil field boilers was presided over by S. J. Dickey, General Petroleum Corp., Los Angeles, as temporary chairman. The late A. B. Steen, Houston, was chairman. The work of the boiler committee is almost complete.

In the absence of Capt. J. F. Lucey, the meetings of the rotary drilling equipment committee were presided over by Frank F. Hill of the Union Oil Co. of California. It was hoped Monday to be able to make a final report at a general meeting of the institute. Monday was given over to discussions of dimensions of shafting keys and keyways, tool joints, drill collars, bits, grief stems and swivels.

The committee on standardization of standard rigs and derricks, which was presided over by Walter W. Fondren, Humble Oil & Refining Co., Houston, as national chairman, was concerned largely with specifications affecting foundation sizes of steel derricks and the interchangeability of this type of equipment as made by different manufacturers. Agreement was reached on material specifications which will be governed by A. S. T. M. specifications for derricks made of structural steel and A. P. I. specifications applying to tubular goods for tubular steel derricks.

Change 90 Per Cent Point to 396 F. To be Asked of Federal Board

Staff Special

TULSA, Dec. 7

COMMITTEE D-2 of the American Society for Testing Materials and the committee on testing methods and specifications of the American Petroleum Institute, meeting in joint session today, voted to instruct their representative on the federal specifications board to vote for a change in the government specifications of U. S. Motor gasoline making the 90 per cent point 396° F. instead of 392° F., the present requirement.

The vote was 16 to 13 and came after a lively debate. Dr. George W. Gray and Dr. K. G. MacKenzie, The Texas Co., R. E. Wilson, Standard Oil Co. of Indiana, and Dr. E. W. Dean, Standard Oil Co. of New Jersey, led the fight against the change. Their contention was that such a change would mean a gasoline of poorer quality and is not justified by present conditions in the refining industry.

It was argued that if the federal specifications board were asked to make unimportant changes that are not justified, it would be harder when conditions required changes to induce the board to make such changes.

It was feared that if a change in the specifications were made that the oil industry could not wholeheartedly justify, resulting in a poorer grade of gasoline, it might bring about the formation of an association of state chemists who would formulate their own gasoline specifications which might impose undue hardship on the refiners to meet them. It was also argued by some opponents of the change that the western refiners, who chiefly were in favor of the change, would not benefit by it as much as they believed from the yield standpoint.

Ralph R. Matthews, Roxana Petroleum Corp., William E. Perdew, Derby Oil Co., and other technologists who represented western refiners, fought for the change. Dr. T. G. Delbridge, who acted as chairman of the joint meeting, stated he believed the change would be made to keep faith with the western refiners if for no other reason.

A letter ballot, which had been previously taken, showed 17 for the change and 4 against it. The extent to which the debate changed the views of the technologists is indicated by the final vote.

At a meeting of committee D-2, earlier, Dr. Matthews, as chairman of the sub-committee on cloud and pour test, reported the sub-committee was working on the pour test method in the effort to solve the difficulties the Pennsylvania refiners are having with the A. S. T. M. pour test method. He is getting some 20 laboratories interested to the point of doing work on it, he said.

Index to This Week's News

National Petroleum News

General

Mexican Embassy Statement on Oil Concessions.....*By Paul Wagner* 25
How Humble Establishes Crude Price Differential.....*By Paul Wagner* 28
Fall and Doheny Conspiracy Trial..... 31

A. P. I. Annual Meeting

C. C. Herndon Urges Cooperation as Means of Conservation..... 17
President Farish's Annual Address..... 44
Care and Use of Belting.....*By David L. Trax* 48-A
Protecting and Reconditioning Underground Pipes.....*By C. R. Weidner* 48-B
Selection and Care of Equipment.....*By Hollis P. Porter* 48-E
Care and Use of Pipe in Field.....*By T. D. Davies and J. B. Graham* 48-F
Fire Prevention in Oil Stations.....*By C. F. Singleton* 48-I
Manufacturing Problems for Refiners.....*By W. F. Zehrung* 48-K
Oil Well Cementing Practice.....*By R. L. Wright* 48-L
Motor Fuel of Tomorrow.....*By T. A. Boyd* 48-N
Payout Status of Oil and Gas Properties.....*By H. G. Humphreys* 49
Public Relations on Important Institute Function..... 53

Production

Rocky Mountain Oil & Gas Association Meeting.....*By J. C. Chatfield* 21
Earlsboro Discovery Wells Making 10,000 Barrels.....*By A. F. Hinton* 40
Northwestern Pennsylvania Producers' Meeting.....*By R. B. Stafford* 58
Increased California Production May Bring Price Cuts.....*By R. J. Pilcher* 62
Natural Soda Drive Aids Salt Creek Recovery.....*By W. T. Thom, Jr.* 74

Refining & Natural Gasoline

Skelly Treats Panhandle Natural Gasoline.....*By J. C. Chatfield* 69
Ethyl Gas Situation Alarms Refiners.....*By Paul Truesdell* 90

Marketing

Standard of Indiana Markets Prediluted Motor Oils..... 27
Heavy Walled Equipment Reduces Corrosion.....*By Dr. H. Schmidt* 85
Filling Station Increases Value of Nearby Property..... 60
1927 Gasoline to Move of Market, Date of Shipment.....*By J. C. Chatfield* 94

Departments

The Editors' Viewpoint..... 79
Here and There..... 104
New Equipment..... 101
New Oil Station Construction..... 106
Oil Patents..... 105

Market Section

Refinery Price Tables.....115-117
Tank Wagon Price Table..... 119
Complete Export Markets..... 121
Crude Oil Prices, All Fields.....122-123
Oil Company Finance.....124-126

National Petroleum News is copyrighted, 1926, by the National Petroleum Publishing Co. Single copies, 10 cents. Subscription rate $2.50 per year in the United States and Mexico (U. S. Money), $3.50 in Canada and $5.00 in all foreign countries. Trademark registered U. S. Patent Office. Members of Audit Bureau of Circulations and Associated Business Papers, Inc.

Published at MAIN OFFICE Cleveland, Ohio
813 Huron Road

TULSA Bank of Commerce Bldg.
NEW YORK 342 Madison Ave.
LOS ANGELES Petroleum Securities Building
HOUSTON 608 West Bldg.
CHICAGO 360 North Michigan Ave.

Work Holds Conference to Decide Status of Shale Oil Claims

Staff Special

WASHINGTON, Dec. 6

HAS an oil shale deposit on public land such a present commercial value as to warrant the secretary of the interior to issue patents to locators of such deposits on the public domain under the placer mining law of 1866? Can a claimant show such a value attached to a deposit that, fairly speaking, he has discovered a valuable mineral?

The foregoing questions, it is believed, lie in the background of a conference or hearing held by Secretary Work of the interior department on Dec. 1 in regard to what he should do with hundreds of claims for patents to oil shale lands owned by the government, about 4000 acres in southwest Wyoming, 2800 in northwest Colorado and 3000 in eastern Utah.

Attorneys for claimants contended, in substance, that claimants had no duty, under the placer mining law of 1866, to show a commercial value as a condition precedent to the issuance of a patent. They contended that the only test the secretary could apply was as to whether the deposit was of such a character as would persuade a prudent man to spend money for the development thereof. That, in substance, is the law as it applies to the precious metals. The attorneys were able and did cite plenty of decisions of courts to show there was no burden to show that digging for gold or other of the precious metals would be profitable as a condition to the grant of a patent to a claimant.

Work Holds Conference

SECRETARY Work felt constrained to hold the conference to obtain the views of claimants and their counsel because the question of issuing or denying patents is directly before him in a large number of shale oil claims under the law of 1866. No such questions could arise under the national leasing law of 1920. That statute provides for the development of minerals on the public lands on a royalty basis. Under the placer mining law the claimant, if he can prove discovery, obtains a fee simple title authorizing him to do with the land whatever he desires, provided that he does what is known as assessment work supposed to show that he intends to work the claim in good faith.

The question as to what constitutes an oil shale discovery was raised in J. D. Freeman vs. George L. Summers. In an unreported decision on that case, made July 29, 1925, the interior department said:

"To warrant the classification of areas of oil-shale land those regulations provide: (1) Where the oil-shale beds are too deep to be mined by open-cut methods, such lands must contain shale capable of yielding 1500 barrels of oil per acre, in beds not less than one foot thick yielding not less than 15 gallons per ton and within a reasonable depth below the surface; (2) where the oil-shale beds are at or sufficiently near the surface to be mined by open-cut methods, such lands must contain shale sufficient to yield 750 barrels of oil per acre in beds not less than six inches thick and yielding not less than 15 gallons per ton. In computing the acre value of the oil shale it is considered that a yield of one gallon of oil per ton of rock is equivalent to yield of 50 barrels (42 gallons each) of crude oil per acre-foot of rock."

Would Follow Mining Law

THE commissioner of the land office is inclined to follow the placer mining law definition of an adequate discovery. In a decision by him on the application of the Empire Gas & Fuel Co. for a patent on shale oil land in the Evanston, Wyo., mining district, First Assistant Secretary E. C. Finney, on an appeal from Commissioner Spry of the General Land Office, said the department would apply the rule hereinbefore set forth. He said that before any of the claims made by the Empire were passed to patents, a showing should be made in conformity with the requirements of the rule and submitted to the department.

The immediate question, therefore, is whether Secretary Work, as the head of the department, shall commit it to the enforcement of the rule as a guide for those undertaking to show they had made a "discovery," in a law sense, of a valuable shale oil deposit.

In the discussion between the secretary and his advisers, the question was raised as to whether an area of oil shale land had any present commercial value; whether the value that it had was not purely potential and based on the assumption that some day the country would have to get its supply of oil from oil shales. The claimants contended that the placer mining law raised no such questions and that the secretary had no right to read into it regulations made by the Geological Survey in 1916 to serve as guides for its field men in the classification of public lands.

Situation Changed Since 1916

THEY argued that it was all right for the survey, in 1916, to issue such a rule for the government of the classification men but that since that time it had become well known that, inasmuch as the development of oil shale lands would be a wholesale transaction, the leanness or fatness of a particular strip of oil shale land had not much, if anything, to do with the question whether the discovery was of commercial value. They pointed out that in dealing with porphyry coppers, the department issued patents on lands showing little copper and that frequently such claims, when worked, turned out, by reason of the mass production methods, to be exceedingly valuable.

Attorney General Boatright of Colorado said the development of western Colorado had been retarded by uncertainty about the grant of patents in accordance with the well established rules relating to discovery, under the placer mining law.

R. D. Hawley who had charge of the presentation of objections to what was called the legislation undertaken by the department, seemingly upon the suggestion of the Geological Survey, argued for a blunt recognition by the government officials of the fact that those who entered claims under the placer law of 1866 had obtained rights that Congress could not and had not sought to take from them and that whatever specifications the survey might prescribe for its agents was not binding upon the claimants.

Value Unestablished in 1916

THAT assertion was made because the survey in 1916 prescribed rules to guide its field men set to classifying lands; that is as to determining whether the land in question was or was not shale land. At that time there was not as much known about shale lands as at present and their value was not so well established.

William C. Russell pointed out that oil shale does not run evenly in richness and leanness through any deposit any more than the porphyry coppers, yet if there is a trace, the man who finds it is recognized as having made a discovery. He pointed out that in many cases porphyry coppers showing only a trace at point of discovery turned out amazingly valuable, when taken as a whole.

He contended that as oil shale development was indicated as a wholesale production process, specifications as to content of kerogen in shale strata were not only illegal but really ridiculous because the mining operation had to be on such a large scale that the average was what would count in the end, and not the richness or poorness of a particular stratum or two or three strata.

Empire Now Operating New Charcoal Plant

BARTLESVILLE, Dec. 5.—The new charcoal gasoline plant of the Empire Gasoline Co. started operations on Nov. 6 on the Weatherly lease of the Empire Gas & Fuel Co., Borger, Tex.

S. B. Crooks, who is in charge of sales, traffic and accounting for the Empire Gasoline Co., expects to begin marketing of natural gasoline from Isom and Pampa in the Texas Panhandle district soon, in addition to the output of the company's plants in Kansas and Oklahoma.

A 7500-gallon Southwestern gasoline plant was purchased by the Empire Gasoline Co. for installation on Bowlegs lease in the Seminole pool recently. The company's headquarters are at Bartlesville.

Montana Oil Men Look Forward to Great Extension of Activity in 1927

By J. C. Chatfield
N. P. N. Staff Writer

GREAT FALLS, Dec. 3

A FORTUNE awaits who will do and will dare."

This line from the new "Montana" song expresses the spirit of leaders of the oil industry of the state who gathered at Great Falls on Dec. 1, 2 and 3 for the second annual convention of the Montana chapter of the Rocky Mountain Oil & Gas Association. Encouraged by their success in the Kevin-Sunburst field operators are preparing for a vigorous prospecting campaign during the coming year. Believing that their state will take its place as one of the important oil producing and manufacturing states of the country, leaders took a look ahead and instructed their legislative committee to:

1. Demand that the coming state legislature modify present tax laws so that the oil business will be on an equal footing with the metal mining business.

2. Support the initiated 3 cent gasoline tax bill to produce money for good roads and demand that the law give Montana refiners an even break with shippers from outside by permitting deductions for shrinkage.

3. Obtain an appropriation for inspection of gasoline for the protection of legitimate Montana refiners who are trying to sell a good gasoline in competition with "field" gasoline.

The Montana chapter of the Rocky Mountain Oil & Gas Association was organized in the spring of 1925 and held its first annual convention in December of that year. E. B. Coolidge, president of the chapter, reported in his annual address that the organization has been remarkably successful in that it numbers among its members nearly every producing, refining and marketing interest in the state. Registrations at the second annual convention totaled 260 and the annual banquet more than taxed the capacity of the Rainbow hotel.

O'Neil Made President

L. B. "TIP" O'NEIL, president of the Northern Star Oil & Refining Co. of Sunburst, and vice president of the California Petroleum Corp. in charge of that company's activities in Montana, was made president of the chapter for the coming year. Mr. O'Neil and his brother, John, have been prominent in the development of the oil industry in Montana since its early days. Recently they sold their holdings in the state to the California company and were retained in charge of the properties by the purchaser.

LaRue Smith, secretary of the Homestake Oil Co., Great Falls, was elected vice president to represent the producing division. He succeeds A. J. Findley, vice-president of the Western Petroleum Exploration Co., who expects to leave the state shortly since properties of his company have been sold.

Mark C. Henderson, general manager of the Sunburst Refining Co., Great Falls, was reelected vice president representing the refining group and C. H. "Cherry" Brown, vice president and general manager of the Arro Oil & Refining Co., Lewistown, was re-elected vice president to represent marketers.

Walter F. Brittan who has been secretary of the chapter since its organization, was re-elected and J. H. Stevenson, comptroller of the Sunburst Oil & Refining Co., was elected treasurer. A complete directory of officers and directors of the chapter is published herewith.

The first day of the convention was given over to group meetings at which the industry's problems were discussed and the legislative policies, summarized above, were adopted. The producer in Montana probably pays more varieties of tax to the state than are imposed in any other part of the country.

ELECTION

Officers and Directors of the Montana Chapter, Rocky Mountain Oil & Gas Association, elected at its second annual convention at Great Falls, Dec. 3.

President

L. B. O'Neil, Sunburst, vice president California Petroleum Corp.

Vice Presidents

For producing group:

LaRue Smith, Great Falls, secretary Homestake Oil Co.

For Refining Group

Mark C. Henderson, Great Falls, manager Sunburst Refining Co.

For Marketing Group

C. H. Brown, Lewistown, vice president Arro Oil & Ref. Co.

Treasurer

J. H. Stevenson, Great Falls, Comptroller Sunburst Oil & Refining Co.

Secretary

Walter F. Brittan, Great Falls.

Directors

W. E. Rice, Kevin, president, Rice Oil Co.

L. B. O'Neil, Sunburst, vice president, California Petroleum Corp.

LaRue Smith, Great Falls, secretary, Homestake Oil Co.

A. E. O'Brien, Lewistown, president, Lewistown Oil & Ref. Co.

C. W. Hart, Missoula, president, Hart Refineries.

C. H. Brown, Lewistown, vice president, Arro Oil & Ref. Co.

Mark C. Henderson, Great Falls, manager, Sunburst Ref. Co.

O. I. De Schon, Great Falls, editor, Montana Oil Journal.

E. B. Coolidge, Great Falls, president, Homestake Oil Co.

Donald Campbell, Forsyth, attorney, Mid-Northern Oil Co.

H. A. Sample, Glendive, Hughes Oil Co.

R. J. Coughlin, Scobey, president, Westland Oil Co.

Many Taxes in Montana

FOLLOWING is a brief summary of their contributions during the past few years:

1. 37½ per cent of the amounts derived by the United States from bonuses, royalties and rentals of leased federal lands or deposits within Montana. These monies, under the federal statute may be used for the construction and maintenance of roads or for support of public schools. (Their distribution in Montana is 50 per cent to the state highway fund and 50 per cent to the counties for schools. For the period 1920-1925, inclusive, revenues from this source amounted to $454,-895.65.

2. General property taxes levied by State and County on oil and gas property, principally rigs, appliances and small structures, same as property generally produce about $50,000.00 annually.

3. Two per cent of the total gross value of all petroleum oil produced through the Special Crude Oil Production License Tax. These monies are distributed 25 per cent to the Common School Interest Income Fund; 25 per cent to county high school; and 50 per cent to the state general fund. For the period 1921-1925, inclusive, revenues from this source amounted to $336,-766.92.

4. Net proceeds tax on net proceeds of oil operations, by ownership, taxable value 100 per cent. The state's share of these monies is distributed according to the levy. For the period 1921-1925, inclusive, revenues from this source amounted to, oil, $47,260.79; gas, $841.14.

5. One per cent upon the total net

At the Rocky Mountain Oil & Gas Association meeting (left to right): C. H. "Cherry" Brown, vice president and general manager, Arro Oil & Refining Co., Lewiston, Mont., re-elected vice president of the Montana chapter to represent marketing interests; Mark C. Henderson, general manager, Sunburst Refining Co., Great Falls, re-elected vice president of the Montana chapter to represent refining interests; L. B. "Tip" O'Neil, vice president, California Petroleum Corp., in charge of production for that company in Montana, unanimously elected president of the Montana chapter; E. B. Coolidge, president, Homestake Oil Co., Great Falls, retiring president of the Montana chapter; Walter F. Brittan, secretary of the Montana chapter, with his chin in the air and an infectious smile, and Bernard O'Connor, manager of the refining department of the California Petroleum Corp., who found it cold at Great Falls during the Montana oil convention.

income from Montana sources of each oil or gas corporation through the Corporation License Tax. These monies are distributed to the state general fund. Under a general classification of "oil companies" which includes producers, refiners, oil appliance furnishers, etc., revenues from this source for the period 1922-1926, inclusive, amounted to $98,869.02.

6. From 1917 to 1926, inclusive, the state has issued 347 oil and gas leases covering 170,340 acres on which there has been paid $140,794.31 in rentals, $13,640 for non-drilling penalties, $877.50 in fees and $390,530.02 on the 12½ per cent over-riding royalty, or a total of $545,841.83 in land revenues. The 154 leases in force on Nov. 24, 1926, covered 75,360 acres of land. Fees and penalties go to the general fund of the state, rentals to the public school income fund and royalties to the public school permanent funds.

Seek Uniform Assessments

A UNIFORM schedule of assessments on rigs and other lease equipment for payment of ad valorem taxes to the state will be sought by the association during the coming year. This will be sought through an appeal to the county assessors. At present schedules vary widely in the various counties of the state.

Amendment to the net proceeds tax will be asked of the coming legislature. This law was passed before the days of oil production to apply to metal mines and does not fit the oil business. The association will ask the privilege of spreading operating costs over a number of years and to be relieved of the necessity of paying on royalty oil.

Donald Campbell, chairman of the legislative committee, pointed out in his discussion of the law that an oil operator may drill a large number of dry holes one year and be forced to charge the loss to operations for that period alone while at a later period he may obtain big production and not gain deductions for previous losses. It was stated that the state board of equalization itself has come to the conclusion that the oil industry is taxed out of proportion.

The association has supported the initiated law increasing the gasoline tax to 3 cents per gallon but fears that some changes must be made by the legislature before it can become a valid law under the Montana constitution and treat all consumers alike. At present the tax is paid by the refiner located in Montana on gasoline consumed in the state and by the jobber on imported gasoline. No deductions are allowed for loss between refinery and automobile. This is a more serious matter in Montana than in many other states because of the cold winter weather. Gasoline is measured at the refinery on a temperature correction of 60 degrees F. At the gasoline pump the temperature often is zero or below and the dealer delivers much more gasoline due to the natural contraction of the liquid. The association will seek an allowance for losses by evaporation, shrinkage and waste up to a maximum of 3 per cent.

An appropriation for inspection of gasoline consumed in the state will be sought to protect refiners who are producing a good motor fuel. It is the complaint of most refiners that about 3,000,000 gallons of off-grade "field" gasoline has been setting the price for 40,000,000 gallons of good gasoline. Price wars have disturbed tank wagon markets at a number of points in the state. For example the present tank wagon and service station price at Butte is 21 cents including the 2 cent state tax.

Geologists' Reports

TWO papers read before the Montana chapter of the Rocky Mountain Oil & Gas Association on Dec. 3, during its recent convention in Great Falls were received by National Petroleum News with Mr. Chatfield's account of the meeting. They are:

"Results of Recent Drilling Operations in Alberta, D. C." by Neil McQueen, geologist, Imperial Oil Co., and "Relationship of Geology to Development of Rocky Mountain Oil Fields," by Ralph Arnold, geologist.

They will be published in later issues of National Petroleum News.—Editor.

Convention Program

PRESIDENT COOLIDGE reviewed accomplishments of the association in his annual address at the first general meeting Thursday morning. He pointed out that the organization has sought to advertise the oil possibilities of the state and by doing so has been partly instrumental in bringing in the California Petroleum Corp. and the Julian Petroleum Co. and the wildcatting campaign of Ralph Arnold and his associates.

To further conservation the association was instrumental in having the state employ C. R. Mazey to standardize methods of drilling, plugging and handling oil wells. Mr. Coolidge paid a glowing tribute to the work of Secretary Brittan and to the vice presidents and committee members.

A paper on oil country banking prepared by R. P. Brewer, chairman of the board of the First National Bank of Tulsa, was read to the convention in Mr. Brewer's absence. He outlined methods used by the Tulsa banks in financing oil activities and expressed the opinion that loans to oil companies are safer than most other types of loans.

R. D. Mayser of the Graver Corp., Chicago, in an address on cracking Montana crude reported on analyses made by his company which indicate that the crude lends itself readily to production of cracking stock. He gave the following yields on 31 gravity Kevin-Sunburst crude, assuming loss at zero:

Product	Gravity Be.	Per Cent of Crude
Gasoline	59.1	25
Kerosene	41.6	6
Cracking stock	28.0	46
Fuel Oil	15.0	23

The cracking stock obtained by the experiments had an initial boiling point of 432 degrees F. and an end point of 760 degrees. Mr. Mayser stated the belief that the cracking stock would yield 75 percent gasoline, 17½ percent zero cold test fuel and 7½ percent loss and carbon.

Conservation Laws

E. G. TOOMEY, attorney for the Montana Board of Railroad Commissioners, reported that the supreme court of the state has held that the state cannot prevent a property owner from producing oil or gas. The court said, "Natural gas found within the territorial limits of this state is not a product which may be conserved and preserved by law as a thing in which the people have a common interest as flowing streams, wild animals, etc." The court refused to prohibit the production of gas for the manufacture of carbon black. The speaker pointed out that the state might prevent waste and complimented the oil men of the state for asking the state to supervise operations by enforcing rulings of the U. S. Bureau of Mines and U. S. G. S.

At the afternoon session, presided over by Vice-President Findley, Dr. C. K. Francis, technologist for the Skelly Oil Co., Tulsa, read a paper on the development of the present day motor fuel. He told of advances in the art of refining gasoline and of the superiority of modern cracked gasolines over straight run products from an anti-knock standpoint and predicted greater efficiency for motor cars as a result. Describing some recent efforts to obtain gasoline from other substances than oil Dr. Francis told of the possibility of producing 180 million gallons of motor fuel from coal by building central power plants and gave the following report on a recent French experiment:

"Some success has been made in perfecting gas making apparatus, which is a part of the car, in which shavings or scraps of wood and other combustible material may be converted into a gas. A demonstration trip including over 20 cars, half of which were equipped with a gazogene for manufacturing their own gas and with no gasoline, was made early in September under the direction of the Automobile Club of France. The route covered a distance of approximately 860 miles and the slowest car finished during the morning of the 12th day.

Generate Own Fuel

ELEVEN of the cars made their own gas. These included two Berliet cars, one Barbier, one Panhard, a Peugeot and three Renault cars. In addition, there were two made by Peugeot which developed their own power from compressed methane. A Benz and a De Dion had a Rex generator. The other cars used National Carburant, Ketol, Cosmoline, methyl alcohol, acetylene and Gaulois Carburant. Speeds of 60 miles an hour were made. A De Dion of 2.5 tons made this speed using Carbonite in the gazogene with no change in the car except increasing the compression ratio to six. Carburetors were removed from some of the cars and the gas fed direct to the cylinders. Carbonite is reported to be a concentrated form of charcoal. Cosmoline is a mixture of alcohol and naphthalene. Acetylene was used in connection with gas oil and benzol. The Gaulois Carburant is a combination of acetylene and 25 percent gas oil. Ketol is a compound made from sawdust or other wood scrap, when heated with lime butyrate and fermentation products."

W. R. Finney, superintendent of the gas and electric departments of the Midwest Refining Co., told the Montana operators how his company built a 25,000-kilowatt generating plant to furnish power for its properties in the Salt Creek field and of the savings which have accrued as a result.

Big Future Predicted

RALPH Arnold, geologist, who has mapped five large structures in Montana recently, three of which are now being tested, stated his belief that the history of oil in Montana lies in the future rather than in the past. "This in spite of the fact that only five commercial fields have resulted from the drilling of more than 170 wildcat wells." Mr. Arnold pointed out that prospectors in the past have drilled largely on the judgment based on their experience in other states. Structural conditions in Montana are so different from those in other states that a great number of the tests have been off structure. As prospecting progresses, however, more experience is showing wildcatters where to drill.

F. D. Zimmerman, director of publicity for the Continental Oil Co., Denver, gave an address on the "Romance of Petroleum." Oliver W. Tong, traffic counselor of Minneapolis, in an address on freight rates warned Montana refiners to study their situation with great care before they build a system of rates to consuming centers. He warned that the Interstate Commerce Commission very often refuses to change rate relationships which grow up with a business even though the system may appear to be quite unjust.

Two Canadian geologists read papers on the last day of the convention. Neil McQueen, geologist for the Imperial Oil Co., Calgary, read a paper tracing recent operations in Alberta. S. E. Slipper, geologist for the Western Natural Gas, Light, Heat and Power Co., talked on gas production and utilization.

John D. Clark, president of the Midwest Refining Co., Denver, made the principal address at the final convention session. He warned the producers that in spite of court opinions such as that cited in Montana by Mr. Toomey, it is highly possible that states may pass laws restricting production.

In example of how states are regulating the use to which private property may be put was pointed out in the case of zoning laws which have been upheld uniformly by the courts. Mr. Clark said that the case for restriction of production in times of overproduction is much stronger than the case for zoning ordinances and urged operators to be zealous in maintaining that the industry can work out its own problems without government interference.

D. W. Greenburg, secretary of the Rocky Mountain Oil & Gas Association, Casper, brought the Montana operators greetings from the parent association in a brief talk.

Development of cracking on the Pacific coast was described in the final address of the convention by Bernard O'Connor of Los Angeles, manager of the refining department of the California Petroleum Corp.

A unique radio program was given at the annual banquet including a dramatic opera "Il Oiliatra," a tale of the morning tour by the well known composer (of bad verse) Orra Irving De Schon-ski, B.V.D., directed by Senator Julius J. Wuerthner-ovitch. In this sad opera the contractor visits his well only to find toolie and driller both asleep. Unable to find his rig the contractor demands an explanation and learns that the crew had a fishing job which resulted in losing everything from tools to crown block and rig in the hole. Fortunately there is a happy ending. The cook runs in to announce that the well has blown in, in the boob sand so all are enabled to go out and sell stock.

Roads Interests Want Gasoline Tax Hike

Staff Special

HOUSTON, Dec. 4.—Roads interests of Texas attending a conference at Austin called by Representative W. A. Williamson of Bexar county went on record, Dec. 2, as favoring an increase in the Texas gasoline tax from 1 to 2 cents a gallon. Enactment of laws to bring about this increase in gas tax and a 40 per cent reduction in automobile registration fees will be recommended to the Fortieth legislature at its 1927 session. Organizations represented at the conference were the Texas Auto Jobbers, Texas Auto Dealers Association, East Texas Chamber of Commerce, County Judges and Commissioners Association, Texas Highway Association and the Texas Council of Safety.

Under the present law one-fourth of the gasoline tax goes to the school fund. Those represented at the conference would seek to have this condition changed through a special election to be held next fall on a constitutional amendment authorizing the placing of all revenue derived from the gasoline tax in the state highway fund and giving to the available school fund all gross receipts taxes on mineral production.

Ohio Jobbers Have New Executive Secretary

CLEVELAND, Dec. 4.—W. A. Milne is the new executive secretary of the Ohio Petroleum Marketers' Association. He succeeded Wayne C. Hughes who went to the Michigan association as secretary when James A. Gilmore became executive secretary of the American Oil Men's Association.

Mr. Milne is new to the oil industry, but he has had long experience in other business and association work. Mr. Milne, W. F. Burke, president of the Ohio association, writes, is a college graduate. He was in business for himself 10 years in Chicago where he was educated and for four years was engaged in colonization promotion work in Alberta, Canada.

In 1914 Mr. Milne returned to the United States to engage in chamber of commerce work. When the United States became involved in the war, he was appointed chief of the speakers' bureau of the U. S. Food Administration under Herbert C. Hoover. He returned to chamber of commerce work after the armistice. During the last four years he has represented an eastern manufacturer in the Ohio valley territory with headquarters at Cincinnati.

Mr. Milne has moved his family to Columbus where the Ohio association has headquarters at 606 Commerce Bldg. He is now calling on the Ohio jobbers to acquaint himself with the marketing division of the industry and its problems.

Mines Bureau Engineer Addresses A. I. M. E.

Staff Special

TULSA, Dec. 4.—R. R. Brandenthaler, petroleum engineer, U. S. Bureau of Mines, Bartlesville, Okla., was the principal speaker at a meet of the Mid-Continent section, American Institute of Mining and Metallurgical Engineers, on the evening of Dec. 2. The meeting originally had been scheduled for Nov. 26, with R. Van A. Mills, also of the Bureau of Mines, as speaker, but his illness prevented his making the talk, and the meeting was postponed.

Mr. Brandenthaler told of work he and his assistants had done in pressure-control experiments in the Davenport field, Okla. Results of this work will be fully covered in a bulletin soon to be published by the Bureau. Associated with him in the Davenport experiments were Hugh M. Kent, who has resigned from the Bureau to become identified with the Prairie Oil & Gas Co., and K. C. Sclater, who is now with Marland.

Back pressure was applied to the wells through the use of tubing and flow-nipples, or beans, the latter being graduated in size of opening until best flowing results were obtained. On one of the wells experimented with, the best flow was obtained with 1¼-inch tubing and a ¼-inch bean. This combination resulted in a steady flow. Among results obtained or to be expected from use of back pressure, Mr. Brandenthaler enumerated prolonged flowing life of well, reduction of gas-oil ratio, reduction of paraffin accumulation, resulting in lowered cleaning-out costs, and abatement of water intrusion. As a result of the Bureau's experiments, he said, about 20 Davenport wells are now being operated under pressure-control.

S. O. of Ind. Official Hurt in Motor Accident

Amos Ball

CHICAGO, Dec. 6.—Amos Ball, vice-president, Standard Oil Co. of Indiana, suffered two broken ribs and serious internal injuries Saturday, Dec. 4, when his automobile was struck by a taxi-cab in Lincoln Park, near the junction of Webster Ave. and the outer Parkway Dr. For a time his case seemed disparaging but attendants at Columbus Memorial Hospital spoke hopefully of his condition Sunday night.

Besides being vice-president of the company, Mr. Ball is a director and general manager of sales. He is 50 years old and lives at 1213 Michigan Ave., Evanston.

John H. Lambert, an executive in Mr. Ball's department, was in the car with him. The cab was occupied by Miss Helen Green of Detroit. Every person in the collision except the cab driver was hurt, including Mr. Ball's chauffeur.

SAN ANGELO, TEX.—The Independent Oil Co., oil marketer here, recently took over the Pierce Petroleum Corp. commission agency.

Gasoline Stocks Turn Up; Crude Output Rises

CLEVELAND, Dec. 4.—Production of both crude oil and gasoline increased in October over September, the Bureau of Mines reports. Gasoline output, 25,762,000 barrels, was the largest in the history of the oil industry and was the result of record charges to stills which averaged 2,227,000 barrels daily.

Shipments of gasoline to domestic consumers totaled 23,488,000 barrels, a volume that exceeded September shipments by more than 1,000,000 barrels but a slump in exports just offset the increased domestic demand. Imports of gasoline rose to 874,000 barrels, also a record.

Stocks of gasoline Oct. 31 amounted to 23,488,000 barrels, an increase of 1,039,000 barrels. Stocks represented 40 days' supply compared with 38 days' Sept. 30 and 50 days' Oct. 31, 1925.

Total crude production was 68,886,000 barrels, a daily average of 2,222,000 barrels. This was an increase of 2 per cent over September production. The largest gains in production again were in Texas and Oklahoma. California made a gain of 8,000 barrels in the daily average.

Development work in the Ventura Avenue field and in Huntington Beach extension was instrumental in boosting production in California to a daily average of 612,000 barrels, the highest point since February. As a result of the rapid development of the Seminole field, Oklahoma eclipsed the 500,000 barrel a day mark for the first time since September, 1925. The Panhandle district, aided by other comparatively recent discoveries in west Texas, was responsible for the major portion of the increase in output of Texas. The usual effect of the approach of winter was felt in the Rocky Mountain states and losses in production were recorded in all of them during October.

Imports of crude petroleum fell off materially in October with the decrease in shipments from South America more than offsetting a small increase in receipts of Mexican oil.

Stocks of crude petroleum were again practically unchanged. East of California stocks were reduced only 600,000 barrels, in California only 35,000 barrels. This decrease, notwithstanding increased production, resulted from a record in runs to stills as outlined below.

Kerosene output was lower in October than in September, domestic demand and exports fell and stocks were increased by 59,000 barrels. Lube stocks decreased 241,000 barrels. Gas and fuel oil stocks east of California fell almost 1,000,000 barrels. Wax stocks increased more than 8,000,000 pounds.

NILES, MICH.—The filling stations owned by Winter & Schulte, at Niles, Buchanan and Berrien Springs, Mich., have been taken over by Winter & Winter, Mr. Schulte retiring from the firm.

Oil Concessions in Mexico to Have Same Duration as Original Rights

By Paul Wagner
N. P. N. Staff Writer

HOUSTON, Dec. 4

CONCESSIONS through which the government will confirm the rights of foreign companies operating in Mexico, "will have exactly the same duration as the original rights, being either for the entire life of the company or for the time provided in the contracts on which those rights are based," according to a statement made Dec. 2 by the Mexican embassy at Washington, with regard to the application of disputed parts of the petroleum law of Dec. 26, 1925, nationalizing subsoil deposits.

The statement applies to a provision of the petroleum law which set up a classification of rights arising from contracts made before May 1, 1917, by the surface owner, or his successors, in title for the express purpose of developing petroleum. In the case of such contracts, the law provided these rights were to be confirmed only for 50 years, but, according to the embassy statement, the limitation provided in the regulations applies only to Mexican companies.

Foreign operators in Mexico had taken the position in many instances that the Calles government was seeking "to convert unqualified ownerships into terms of years by the simple device of requiring the existing titles to be exchanged for concessions of limited duration."

Although the rule laid down in the statement issued by the embassy would, inferentially, protect foreign owners of subsoil rights where title was acquired for the express purpose of developing petroleum, oil companies operating through Houston are not advised that Americans who own lands in fee where the presence of petroleum was not suspected prior to effectiveness of the 1917 constitution would have similar protection. This may prove another point for diplomatic exchanges and bring about a reopening of discussions between the Washington and Mexico City governments.

Embassy Statement Informal

THE embassy statement, although regarded at Washington as being made informally, tends to clear many disputed points in the application of Mexico's petroleum law, especially with regard to actual operations requirements, presumably referring to the "positive acts" doctrine applying to properties acquired prior to May 1, 1917.

It is pointed out in the statement that since this doctrine "seems to have caused uneasiness among foreigners" it is convenient to make known how the government interprets the regulations applied to properties acquired before May 1, 1917, but not developed by that date. The statement then goes on to say that "investments made before the granting of the concession will be considered satisfactory and in compliance with the condition as to 'actual operation' and nothing further will be required during the term of the concession."

Will Consider Rights

THE Mexican government will maintain the owner of such rights in his legal possession in case of controversy, it is promised, adding ". . . ., thus not only recognizing rights derived from private agreements, but lending them additional strength. . . . The concessions will have over former titles, leases or agreements the advantage of being unassailable in either administrative or judicial controversies."

The embassy statement added that foreign company rights acquired before May 1, 1917, "will be confirmed by the government not only without cost but without the declaration renouncing diplomatic protection required by law for future acquisitions."

One classification of petroleum rights under the Dec. 26, 1925 ,law had and exploit oil deposits before the provisions or the provisions of the 1917 constitution. This classification embraced properties in which the privileges of owners were transformed into acquired rights by positive acts of petroleum exploitation prior to May 1, 1917. Operating companies continue indefinitely in the exercise of their rights of exploitation of these properties and surface owners of the land are likewise undisturbed in the benefits accruing to them from development.

A third classification set up in the petroleum law affected beneficiaries of any contract for the exploitation of petroleum entered into between May 1, 1917, and Dec. 1, 1925, who were to have the preferential right for a year to obtain concessions from the Mexican government in accord with the stipulations of the law and the regulations. The period for obtaining such "confirmatory concessions" expires Dec. 31, 1926.

Advices to Houston about the classification referred to in the last preceding paragraph, are not clear except that "the government (Mexico City) has declared that in cases in which interests of foreigners are involved the ailen land law and its regulations shall be applied preferentially."

Millions of Acres Affected

THE situation in Mexico, which has been the cause of diplomatic exchanges between Washington and the Calles government, has been important because of the millions of acres of lands in Mexico which were acquired by Americans before May 1, 1917; these lands at the time of acquisition carried subsoil rights.

The American attitude with regard to fee lands of the character mentioned has been that subsoil rights belong to the surface owners regardless of whether the buyers suspected the presence of petroleum in the subsoil at the time of purchase and regardless of whether any positive step had been taken to locate and exploit oil deposits before the promulgation of the 1917 constitution. Until the embassy statement was issued at Washington it had been feared the Mexican government's attitude was that some positive step should have been taken to indicate the owner's intention of developing for oil. Even now the Mexico City attitude on this phase is not considered entirely clear.

Developments Awaited In Mexican Case

HOUSTON, Dec. 6.—American companies operating in Mexico will await developments in connection with a policy outlined in a Mexican embassy statement issued at Washington, Dec. 2, it was learned after a secret conference in San Antonio Dec. 4. It was said that further events are expected to clarify the embassy statement regarding interpretation by the Mexican government of its petroleum regulations and the alien land law.

Among others the conference at San Antonio is said to have been attended by William Green, George Schroeder, J. F. Fly, Pat O'Rourke, Eric E. Lowell and Walter Temple, all with Tampico headquarters and representing the following companies: Pan American Petroleum & Transport Co., and its subsidiary, Huasteca Petroleum Co.; International Petroleum Co., subsidiary of the Mexican Seaboard Oil Co. of Maine, and the various subsidiaries of the Royal Dutch-Shell group.

Coolidge Disparages Centralized Business Regulation

WASHINGTON, Dec. 7

ECONOMY and more economy constitute soul and body of President Coolidge's message to Congress today, assembled for the short session of the 69th since the adoption of the Constitution.

"The one weak place in the whole line (of our national defense) is our still stupendous war debt," is his matured conviction. In discussing that national defense, after saying our air force should be improved, he said that the army and navy are not supported for the benefit of supply concerns. The declaration was obviously made out of the fullness of his experience with the propaganda that is always being carried on by makers of martial baggage.

There is not a word in the message about oil or the necessity for conserving the supply thereof. The fact that the Federal Oil Conservation Board has not completed its report on the subject is reason enough for the abstinence. The trial of Fall and Doheny, now going on, is another reason for not bringing up the subject at this time. Congressmen may talk about a subject that is being tried in the courts but few Presidents of the United States have shown such lack of respect for a co-ordinate branch of the government as the members of the legislative branch. Senator Walsh of Montana (the President's observance of the proprieties recalls) made a speech over the radio about the lease cases while the grand jury was considering the matter, which was of the prosecutor type.

Nothing in the message, however, is expected to attract so much attention in the business community of the land, as his declaration that he was in favor of reducing, rather than expanding government bureaus which seek to regulate and control the business activities of the people. It is in line with the policy he showed when he re-organized the Federal Trade Commission, which reorganization has been facetiously called a "getting of religion" by that often pettishly pestiferous body. The Coolidge idea is that abuses should be eradicated in the places where they are found, by the local authorities.

Whether his views on that subject will have any weight with the Congress elected last month, when it meets a year hence, is something to be speculated upon by those fond of that sort of employment. The President's whole thought on the subject of centralized regulation, from Washington, is as follows:

"I am in favor of reducing, rather than expanding, Government bureaus which seek to regulate and control the business activities of the people. Everyone is aware that abuses exist and will exist so long as we are limited by human imperfections. Unfortunately, human nature cannot be changed by an act of the legislature. When practically the sole remedy for many evils lies in the necessity of the people looking out for themselves and reforming their own abuses, they will find that they are relying on a false security if the Government assumes to hold out the promise that it is looking out for them and providing reforms for them.

"This principle is preeminently applicable to the National Government. It is too much assumed that because an abuse exists it is the business of the National Government to provide a remedy. The presumption should be that it is the business of local and State governments. Such national action results in encroaching upon the salutary independence of the States and by undertaking to supersede their natural authority fills the land with bureaus and departments which are undertaking to do what it is impossible for them to accomplish and brings our whole system of government into disrespect and disfavor.

"We ought to maintain high standards. We ought to punish wrongdoing. Society has not only the privilege but the absolute duty of protecting itself and its individuals. But we cannot accomplish this end by adopting a wrong method. Permanent success lies in local, rather than national action. Unless the locality rises to its own requirements, there is an almost irresistible impulse for the National Government to intervene. The States and the Nation should both realize that such action is to be adopted only as a last resort."

Shell Completes World's Deepest Paying Well

LOS ANGELES, CALIF., Dec. 4.—The Shell Co. of California established two world records the past ten days in the Ventura Avenue field, cementing the longest string of 15½ inch casing ever landed in an oil well, and completing the deepest commercial oil producer in the world.

Shell Company's Gosnell 23 in the proven area of the Ventura Avenue field was drilled to 3,000 feet where a string of 15½ inch, 70 pound, American Seamless pipe was landed and cemented. In this hole, 300 feet of 23 inch stove pipe casing was landed, in place of 18 inch, which is customary. This test is intended to go to 7,500 feet or deeper, unless an extremely good well is finished at a lesser depth. In fact, Shell officials want to test the depth of the producing sands in this field, so far unknown.

Shell Company's Edison 10 in the same field was completed recently at 6,603 feet for 2,800 barrels of 29 gravity oil and the well settled to 2,200 barrels a day late this week. This is the deepest commercial producer in the world. The Associated Oil Co. previously held this record, also in the Ventura Avenue field.

Texas Sues For Lands Producing Oil

Staff Special

HOUSTON, Dec. 4.—The land on which the Transcontinental Oil Co., and the Mid-Kansas Oil & Gas Co. recently completed a 100 barrel well in Pecos county was brought into litigation, Dec. 2, with the filing of a suit by the state of Texas for recovery of title on 2,214.4 acres. The acreage is described as school land and the petition names as defendants Brown Bros. of San Angelo, a firm consisting of R. Wilbur Brown and Kenneth Brown, together with Ira G. Yates and wife, Anna Yates, of Pecos county, to whom two tracts were conveyed under grants from the state Aug. 1, 1923.

The state's petition charges that the oil companies and the Peerless Oil & Gas Co., of Indiana, Pa., a royalty owning organization, unlawfully took possession of the land and its mineral content, including gas and oil; the oil companies moving on the land in December, 1923, under oil and gas leases obtained from Mr. and Mrs. Yates.

Phillips Denies Merger With Texas Likely

TULSA, Okla., Dec. 4.—Published reports today from New York that officials of The Texas Co. are soon to inspect properties of the Phillips Petroleum Co. with intent to acquire the company by stock exchange, drew from Frank Phillips, president of Phillips Petroleum Co., a denial of a contemplated merger.

The statement given to National Petroleum News in a telephone conversation with Mr. Phillips at Bartlesville was the only comment he would make. It was being released at the same time to the Associated Press. It follows:

"Frank Phillips, president of the Phillips Petroleum Co., said he did not desire to comment on the gossip connecting his company with the visit to the Mid-Continent fields of the officials of The Texas Co. Mr. Phillips, in view of having denied so many times the stories of mergers of Phillips with other companies, stated he saw no occasion to countenance this one. He states the position of his company remains the same as it always has been and no merger, sale or combination is contemplated."

S.O. Indiana Places New Pre-diluted Motor Oil on Market Dec. 8

Staff Special
CHICAGO, Dec. 7

THE Standard Oil Co. of Indiana tomorrow will place on the market throughout its territory a pre-diluted motor oil which has been christened Iso-Vis. Introduction of the new motor oil, which has been discussed in the oil industry for many months since a paper on it was read at last winter's meeting of the Society of Automotive Engineers, was accomplished through advertisements in daily newspapers in every sizeable town in the 11 states where the company markets.

The name is derived from a contraction of the Greek word "isos" meaning equal and "viscosity."

It was the intention of the Standard to begin distribution of the new oil Dec. 1 but something caused it to delay its advertising campaign until tomorrow. The oil has been on sale for several weeks at some of the Standard's stations but no effort was made to merchandise it until this week.

Standard Issues Statement

THE Standard issued this statement: "The new Iso-Vis line of motor oils, announced this week by the Standard Oil Co. of Indiana, is the culmination of three years of intensive research by the company's engine laboratory, on the problem of the dilution of the crankcase oil by the heavy ends of gasoline, particularly in winter operation. Their essential feature is the counteraction of the bad effects of dilution by starting with a heavy oil the vapor pressure of which has been adjusted, so that its viscosity remains substantially constant in the desirable range, instead of being like ordinary oils which are either too heavy when fresh or too light after 100-150 miles of use.

"The theory of equilibrium dilution which led to the invention of the new type of oil, and the practical results which they gave in service under a wide variety of conditions were described before the Society of Automotive Engineers at their annual meeting last winter, and published in the February number of their journal and in various other publications.

Dilution All in First 200 Miles

THE extensive results reported by Messrs. Wilson and Wilkin show that the ordinary type of oil in the average car in winter picks up about 16 per cent of diluent in the first 150-200 miles operation, thereby losing fully two-thirds of its initial viscosity. Beyond this point there is little change in dilution or viscosity as long as operating conditions do not change markedly. This does not mean that diluent stops going into the oil during periods of cold starting.

"As a matter of fact it probably goes in just as ever, but after about 16 per cent of diluent accumulates in the oil the amount driven off during the periods of hot operation on the average just balances that which comes in during cold starting, thus producing a balanced or equilibrium condition as long as the cycle of operating conditions is reasonably constant. Marked changes in weather or operating conditions will, of course, be reflected in fluctuations up or down in the equilibrium amount of diluent.

"The results of the laboratory's work also indicated rather definitely that for winter conditions the viscosity of the oil should be kept within rather narrow limits, in fact between 160 and 200 seconds Saybolt at 100° F. for the best results. If the viscosity of the oil in the crankcase is above 200 seconds at 100° F. it thickens up so much at low temperatures that starting in cold weather becomes difficult or impossible, and there is frequently a warming up period of 5-10 minutes before the oil can be sucked into the oil pump and circulated to the vital parts of the engine. Many bearing failures and scored cylinders have been traced to the failure of lubrication during this warming up period when the oil is too heavy to circulate.

Too Thin Oil Permits Abrasion

ON THE other hand, if the viscosity of the oil drops much below 160 seconds at 100° F., it will not have enough body to preserve a good lubricating film after the engine warms up. This may not do much harm if the oil is clean, but as dirt and grit accumulate, too thin an oil will permit much abrasion of bearings, piston rings, and cylinder walls.

"If the motorist, recognizing the desirability of having a viscosity in this optimum range, selects a very light oil having an initial viscosity of say 200 seconds, he will have excellent results for the first 25 miles or so, but as dilution accumulates the oil thins down very rapidly and by the time it picks up the equilibrium amount its viscosity will be about 80 seconds Saybolt, which is far too low for safety. If, on the other hand, the motorist selects a medium motor oil of say 325 seconds viscosity, which is probably about the best compromise available in the ordinary type of oils, he will have about 50 miles of hard starting and poor cold lubrication, and then pass rapidly through the optimum range of viscosity and approach an equilibrium viscosity of about 107 seconds which is again too low for satisfactory lubrication, although it gives fair results providing the oil is changed frequently as dirt and grit accumulate.

"If the motorist recognizes this excessive thinning out of light and medium oils and decides to use a heavy oil of say 500 seconds initial viscosity, he finds it almost impossible to start his car in cold weather and frequently gets no lubrication during the warming up period. This condition of very hard starting and poor cold lubrication persists for the first 100 or 150 miles, but beyond 200 miles the heavy oil has on the average picked up enough diluent to thin it down to the right body and approach an equilibrium viscosity of about 165 seconds. Beyond the first 200 miles this heavy oil is therefore an ideal lubricant, at least so far as viscosity is concerned.

Refinery Dilutes Oil

THE essential proposition of the Iso-Vis oils is to take such a heavy oil and accomplish in the refinery what would otherwise have to take place in the car during the first 150 or 200 miles of troublesome operation. In other words, the refinery increases the vapor pressure of this heavy oil to correspond to that of the oil already in the crankcase and thus prevents it from picking up more gasoline and lowering its initial. This lowers its viscosity to about 200 seconds and from that point it thins out very little as it picks up only 5 or 6 per cent more diluent to reach the average equilibrium dilution. Cars equipped with dilution eliminators which ordinarily hold the dilution around 10 per cent in winter will show a practically constant viscosity of 200 seconds. In summer operation 2 or 3 per cent of the diluent is generally driven off and the oil thickens up to about 250 seconds as is desirable.

"In addition to the primary advantage of practically constant viscosity in operation, which gives rise to the name 'Iso-Vis,' Messrs. Wilson and Wilkin also report that the new oils change much less in viscosity with temperature than do ordinary oils because of the relatively small temperature coefficient of the diluent. The new line of oils is made from specially selected crudes to give very low pour test, low carbon, and good color, and is marketed from the original package only as a premium grade of oil. In addition to the Iso-Vis Medium recommended for practically all passenger cars, there are heavier Iso-Vis oil for trucks, buses and tractors, to which the same general principles have been applied."

How Crude Is Valued for Its Naphtha; Description of Laboratory Still

By Paul Wagner
N. P. N. Staff Writer

HOUSTON, Dec. 2

AFTER the Humble Oil & Refining Co. had led in revising the crude price differential in the Southwest from 8 cents to 5 cents per degree of gravity Nov. 1, this periodical printed exclusively the detail of how the company's purchasing policy reflected the Humble's measure of raw material values in terms of salable products.

Briefly restated, the Humble had found in laboratory tests checked against actual plant operations that the gasoline contents of crudes produced in Texas average about 1.6 per cent variation of gasoline yield for each degree of gravity change. Based on the formula used by the Humble such a variation in gasoline yield was taken to justify the 5-cent differential in place of the previously prevailing 8-cent differential.

Since the publication of the earlier article, which appeared on pages 17-20 of the Nov. 10 issue, considerable interest has been shown in the detail of laboratory methods Humble used in arriving at the results. The original article dealt almost exclusively with the economic phases of the Humble's crude evaluation and the formula used by it in establishing relative values after the variation of yields of crudes had been determined.

In this article it is proposed to discuss the physical tests of crudes made by Humble at its Baytown refinery laboratory and checked against results obtained in regular plant runs on similar, or identical, oils. Included in this discussion is a description of the laboratory apparatus used for determining the naphtha contents of crudes, together with a drawing showing the detail of the specially made still used.

The still was built with the idea of duplicating plant yields of naphthas as nearly as possible. Cracking did not enter into the crude evaluation work, nor did the tests take particular account of the values of other products than naphthas and fuel oils in so far as price-making was concerned.

As explained in the earlier article, and indicated by a chart which accompanied it, kerosene yields of crude from a given district are fairly uniform when stripped to the same degree for gasoline, regardless of the gravity of the crude. A similar statement applies roughly to gas oil yields. Therefore, for crude evaluation purposes the variation of gasoline content per degree of gravity and the variation of fuel oil recovery constituted the two factors the Humble sought to establish.

Reflux Laboratory Still

AS aforementioned, the design of the laboratory apparatus, which is known as the "controlled reflux still," is based primarily on actual plant practice. How closely results check is shown elsewhere in this article. Here, it is proper to say, the apparatus, which is sketched in Fig. 1, is used for all light crude evaluation work. The equipment consists of a 7½-gallon still made from 10-inch pipe with one end flanged for opening; a reflux column of 3-inch inside diameter iron pipe, 40 inches high and mounted on still. The top of this column is coupled to two condensors, which can be used independently, one in an iced bath for light fractions and the other of Liebig type with water and steam connection.

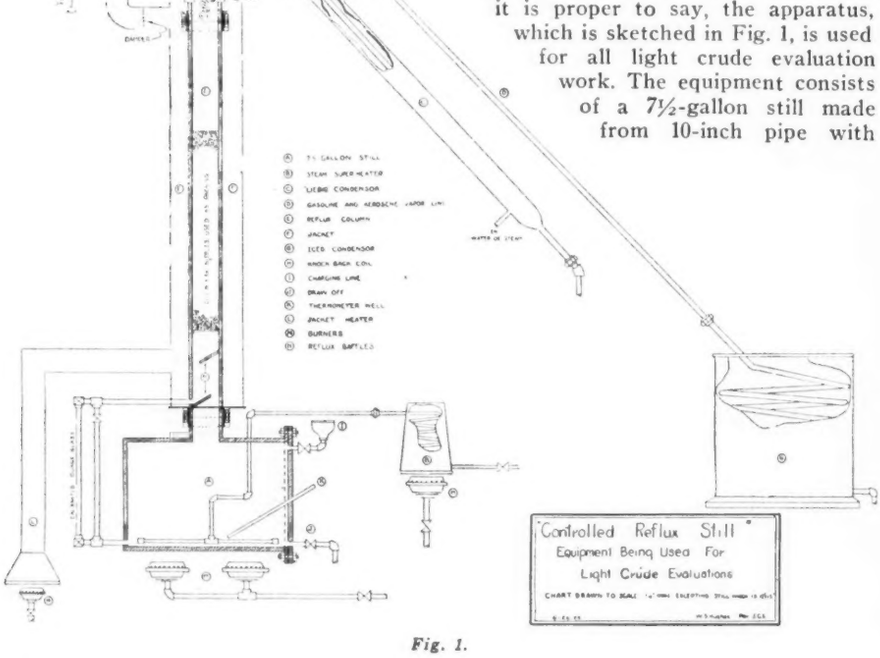


Fig. 1.

The still proper is well insulated and is equipped with thermometer well and open steam coil. The column is jacketed so as to maintain any desired temperature without variation. Reflux baffles were placed in the column so that the reflux could be measured at intervals through a graduated sight glass in the front of the still, the measured oil then being discharged to the bottom of the still.

The column has 21 inches of packing made from ½ inch lengths of ¼ inch pipe; and the top of the column is equipped with a brass tubing knock-back coil using water.

Method of Operation

THE usual charge to the still is 20,000 c.c. At the start the Liebig condensor is by-passed and the light overhead taken off through the coil condensor in an iced bath, making cuts of either 2½ per cent or 5 per cent, which are afterwards blended in proportions required. Steam is cut in at a still temperature of 300° F.

A pilot light supplies heat to the jacket of the reflux column and water is turned into the knock-back coil to maintain a ratio of reflux to condensate of 2 or 3 to 1. This ratio is maintained throughout the gasoline and kerosene fractionation, the reflux being measured in a graduated column installed for that purpose and the condensate held at a discharge rate of 50 c.c. a minute.

After completion of gasoline and kerosene fractionation the coil and condenser is by-passed and the Liebig cut in. All gas oil and paraffin distillate are recovered through this condenser. The heat to the column jacket is greatly increased during this part of the operation in order to reduce the reflux rate and the cooling medium is also cut out of the knock-back coil.

The operation of this still is necessarily a batch one, whereas the present modern day refinery practice involves continuous operation of a battery of stills, and the feed is entering the first still in which uniform temperature is maintained. Therefore, for comparative results, the temperature on the laboratory still must be brought up fairly rapidly. This usually takes from 15 to

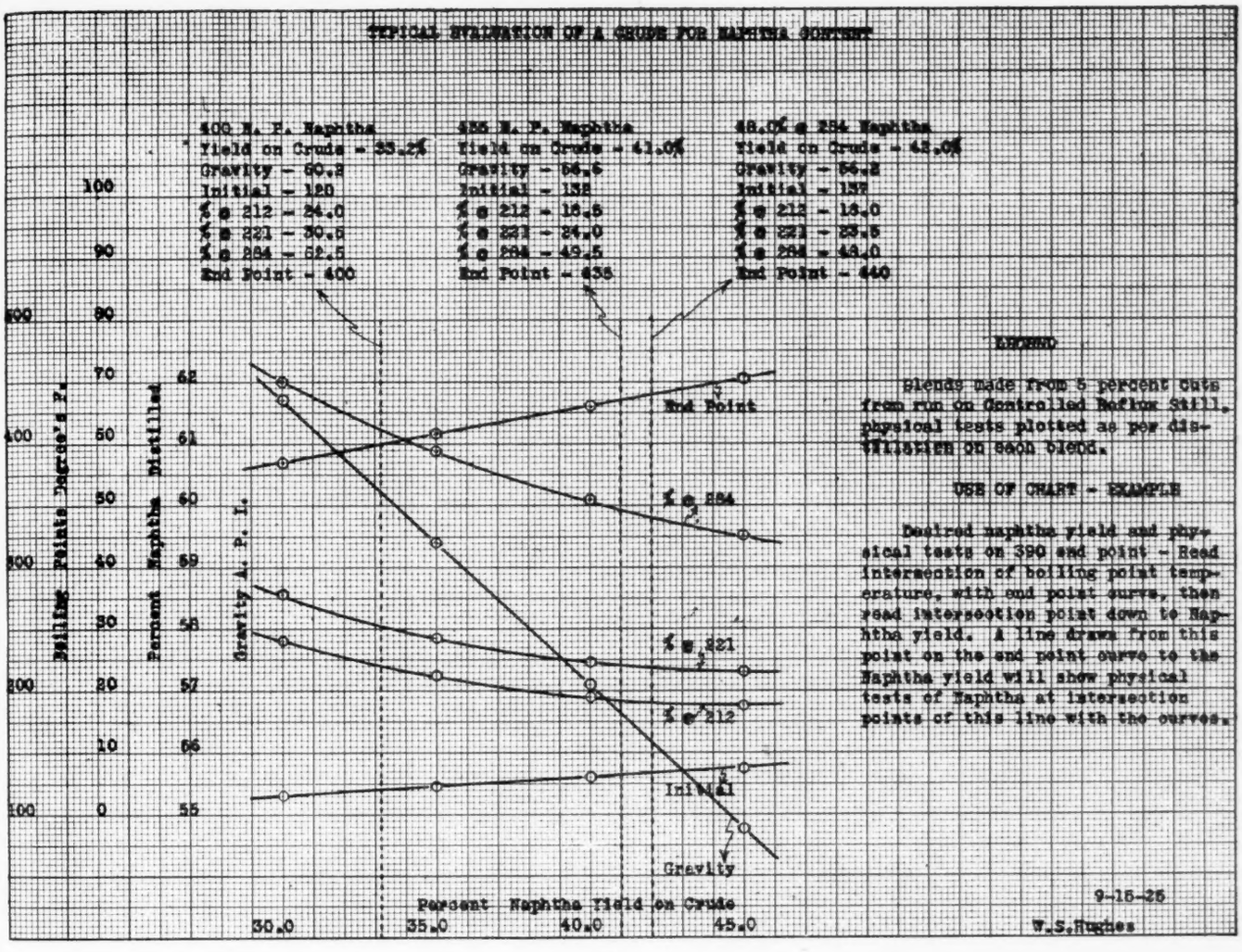

TYPICAL EVALUATION OF A CRUDE FOR NAPHTHA CONTENT
400 E. P. Naphtha
Yield on Crude - 35.2%
Gravity - 60.2
Initial - 120
% @ 212 - 24.0
% @ 221 - 30.5
% @ 284 - 52.5
End Point - 400
390 E. P. Naphtha
Yield on Crude - 41.0%
Gravity - 58.6
Initial - 132
% @ 212 - 16.5
% @ 221 - 24.0
% @ 284 - 43.5
End Point - 438
430 E. P. Naphtha
Yield on Crude - 42.0%
Gravity - 56.2
Initial - 137
% @ 212 - 16.0
% @ 221 - 23.5
% @ 284 - 43.0
End Point - 440
LEGEND
Blends made from 5 percent cuts from run on Controlled Reflux Still, physical tests plotted as per distillation on each blend.
USE OF CHART - EXAMPLE
Desired naphtha yield and physical tests on 390 end point - Read intersection of boiling point temperature, with end point curve, then read intersection point down to Naphtha yield. A line drawn from this point on the end point curve to the Naphtha yield will show physical tests of Naphtha at intersection points of this line with the curves.
End Point
% @ 284
% @ 221
% @ 212
Initial
Gravity
Boiling Points Degrees F.
Percent Naphtha Distilled
Gravity A. P. I.
Percent Naphtha Yield on Crude
30.0
35.0
40.0
45.0
9-15-26
W.S.Hughes

Fig. 2

20 minutes, as stated, to bring up to approximately 300° F. Thereafter, the temperature is brought up to maintain the required reflux ratio of between 2 and 3 to 1, usually requiring about 1 degree a minute, or 2½ hours to bring the temperature from 300° to 450° F.

Reference is made to a condenser in an iced bath on the light coil, whereas, of course, no such conditions exist in refinery practice. It has been found, however, that on account of bringing up the temperature rapidly to condense the light ends, this being a batch operation, better control can be maintained with an iced bath.

The light overhead cuts of 2½ per cent or 5 per cent are blended for specification products and regular Engler runs made on such blends, the results being noted with the addition of each cut; thus the distillation points, including initial and end points, are obtained and the results platted. The yield of any given specification product can be obtained from the curves established on this plat, as illustrated by Fig. 2. The whole time required for making such a run is usually about six hours, which includes the operation of the still and the running of the Englers in connection therewith.

At the time of adoption of the reflux still apparatus and the method of laboratory procedure described, a great many runs were made of identical charging stocks going to the stills in the yard; and various checks were established on the apparatus. Some variation, of course, was to be expected, because of the various elements entering into the operations; however, it was found that on the laboratory still yields checked with the most efficient stills in the yard within a range of perhaps not more than 3 per cent by volume of gasoline produced, and a factor of safety should be used to adjust for such difference.

Continued checks have been made and some of the more recent results are given as follows:

(1) A plant run on crude for a period of two weeks, cutting maximum 400 end point naphtha gave a yield of 33.95 per cent. A comparative laboratory run on reflux still on sample taken from charging pump in this period showed a yield of 33.4 per cent, physical tests of products being similar.

(2) A second plant run on the same crude for a period of six days showed 36.84 per cent of 400 end point naphtha as compared with 37 per cent on the laboratory reflux still.

(3) A third plant run cutting for 400 and 430 end point stocks yielded 29.4 per cent of 400 e.p., and 2.62 per cent of 430 e.p., or a total of 32.04 per cent. The laboratory reflux still run for maximum 400 end point showed 33.2 per cent. The plant yield in this case, on account of cutting for intermediate points on 430 end point, was perhaps less than would have been the case had the cut been entirely for 400 end point, refluxing for the maximum yield.

(4) A fourth run made on a similar crude to that used in the No. 3 test, over a period of seven days, gave a plant yield of 25.78 per cent of 375 end point, 7.9 per cent of 400 end point and 1.36 per cent of 430 end point, a total of 35.04 per cent as compared to a maximum yield of 36.8 per cent of 430 end point on the laboratory reflux still. This same crude was run for another period of seven days, cutting for 375 e.p. and 430 e.p., showing 26.96 per cent of 375 e.p., and 7.64 per cent of 430 e.p., or a total of 34.6 per cent, this also comparing with laboratory reflux still result of 36.8 per cent hereinbefore given.

It will be seen from the foregoing illustrations that results check fairly closely, although in instances where (during the period) different cuts were made of different specification naphthas there are greater variations than in cases where direct comparisons could be made. This is naturally accounted for by the plant having to readjust tem-

peratures on stills in order to make these cuts; in some instances, with perhaps small sacrifices in yields.

In the foregoing connection it should be borne in mind that the laboratory determination has been made for a given specification product, showing in each instance the maximum yield possible.

Characteristics Vary Somewhat

SOME differences have been noted in the characteristics of the gasolines produced by the reflux laboratory still and those which may be produced in plant stills properly equipped with fractionating devices, especially in the percentages off at low boiling points. This is due to the greater reflux ratio in the laboratory still than is ordinarily the custom in plant practice. These differences affect more particularly the 212° point.

It has been mentioned previously that an iced bath is used for the recovery of light fractions; one reason for this is to overcome the differences in recovery between this laboratory still and plant practice, and since the laboratory run is for maximum yields of a given end point, or for gasoline of intermediate fill, the maximum fractionation at the end point or at the intermediate points is carried on in order to get the maximum yield.

The point is made finally that whatever the results obtained the tests are considered adequate. Of course, in the operation of stills in a refinery yard, even on identically the same charging stock, differences may be noted in yields, due to the human element. On the laboratory still, the same men are working on various tests, so that every run is considered to give more accurate results from the standpoint of comparative values than it is possible to get in actual refinery yard practice.

Values In Price-Making

VARIATIONS of yields of products per degree of gravity known, with special regard given to gasoline and fuel oil the Humble proceeds to establish its crude differential on the basis of plant values and f.o.b. refinery markets. On the basis of 1.6 per cent variation of gasoline yield per degree of gravity on crude from Texas differential fields, as explained in the earlier article, the formula is worked out as follows:

By multiplying the percentage variation by the number of gallons in a barrel and then by multiplying the result by the difference in value of a gallon of gasoline and a gallon of fuel oil at the refinery. Thus, with North Texas gasoline at 9¼ cents and fuel oil at 3¼ cents, the formula becomes:

1.6% x 42 x 6c equals 4.0326c

The first stage of the formula reflects conversion of 1.6 per cent (1.6 gallons in 100 gallons) to a proportionate variation in a barrel of 42 gallons, which amounts to .67 gallon. That quantity multiplied by the difference in the two values of gasoline and fuel oil at the refinery shows the adjusted, or net, value of the .67 of a gallon change in yield per degree of gravity.

How to Hold a Retail Dealer Told by Iowa Jobber

Staff Special

CHICAGO, Dec. 3

KEEPING garagemen, filling station operators and other retail dealers firmly attached to one source of supply for gasoline and oil is a problem that has puzzled many a jobber. In a recent issue of "Independent Topics," the official organ of the Iowa Independent Oil Men's Association, an oil man discussed the matter from his own experience, somewhat at length. It was full of ideas, all dignified with some degree of success in actual practice. The only clue to the author's identity is the statement in the bulletin that he was once president of the Iowa jobbers. His treatise follows:

"When the average jobber finds he has lost a perfectly good dealer account, about the first thing he does is cuss the particular competitor who took the business away from him and tries to place the blame for his loss on the unscrupulous methods employed by said competitor; whereas, four times out of five, it was the superior merchandising methods (rather than the unscrupulous) that landed the business for the competitor.

"When you ask one of these wailing jobbers, 'What are you doing to hold your dealer accounts?' the usual answer is, 'Well I give them good stuff and good service—about all any one can do.'

"But is it?

"Have you ever tried making every worth-while dealer a part of your organization? Do you get the idea over to them, either personally or through your salesmen, that 'only as they prosper, you prosper'? Do you do anything to help them increase their business, especially their sales of your products? You may well ask, 'How can I do these things so that they will count?'

One Sure Method

"PROBABLY the surest way of making your good dealers a part of your organization is by selling them stock in your company. One hundred dollars to $500 (depending on the size of the dealer) usually is enough to bind him to your organization and make him a booster so long as ye both shall live.

"Of course, this is not always possible, but it is the one best bet if it is possible. Probably the next best thing is to get your customer tied up on a contract over a period of years, by the terms of which you agree to furnish certain equipment, do a certain amount of advertising, etc. It is usually just as easy to get a customer to sign a pump and tank agreement covering a period of five years as it is for one year.

"Get up and send out regularly each month a comparative sales record of all of your dealers in a certain territory, showing not the number of gallons sold, but the percentage of increase or decrease in the sales of each of your dealers over the corresponding month of the year before. This comparative sales record makes your dealers feel that they are part of your selling organization and puts each one of them on their toes to make a favorable showing.

"Carrying this idea further, it might be advisable to offer prizes to the three dealers showing the largest percentage of increase in gallonage on either all grades or possibly on only premium grade gasoline. Along with each monthly comparative sales record send a well-written pep letter in which you throw a few bouquets at the leaders for the past month and a word of encouragement to those who are trailing behind.

"To help your dealers increase their sales and at the same time make them feel that they are a part of your organization, encourage some of your regular patrons to patronize your dealers, asking always for your particular products. If you use coupon books and you can get a few coupon book customers to patronize one of your dealers regularly that dealer will almost have to continue handling your products. Likewise, make it possible for every one of your credit customers, who run a monthly account, to get their requirements through your dealers as well as through your own service stations. The dealer will appreciate not only the patronage of your regular monthly account customer, but also the fact that YOU are carrying the account instead of him carrying it.

"A few suggestions along the lines of advertising helps follow:

"Above all things keep your dealers' pumps well painted and your signs or globes in first-class shape, so that they really are an advertisement and a credit to yourself and your dealer. If you advertise in the newspapers, list your dealers in the vicinity covered as "DISTRIBUTORS" of your products. Most dealers get a kick out of seeing their name in print, especially if it doesn't cost them anything. They are always prone to overrate the benefit they get from your advertising.

"If you are distributing road maps, Ford gauge sticks, spark plug testers, lead pencils, calenders or any form of novelty advertising, place a fair share of them for distribution through your dealers.

"In brief, make your dealers feel that they are in reality your distributors and, as such, are an integral part of your organization."

Fall and Doheny Witnesses Support War Peril Plea in Oil Lease

Staff Special

WASHINGTON, Dec. 4

THE defense in the case of Albert B. Fall former secretary of the interior and E. L. Doheny, California oil operator and builder of the Pan American Petroleum & Transport Co., on trial here for alleged conspiracy in the granting of Pearl Harbor, Hawaii, oil storage contract and the Elk Hills naval oil reserve lease, succeeded today in getting before the jury testimony that a grave national peril existed in the Pacific in 1921 and 1922 at the time Doheny, and the interior and navy departments were negotiating over the contract and leases. The government rested its case Thursday.

Testimony concerning the national peril and the desire of the navy to get a fuel oil depot in Hawaii quickly, was given by Capt. J. K. Robison who as chief of the naval bureau of engineering, conducted the negotiations for the navy department. No nation was mentioned under an order of Justice A. A. Hoehling who is sitting in the case in the Supreme Court of the District of Columbia, when Capt. Robison presented a letter from Secretary of the Navy Wilbur directing him not to disclose any confidential information that had come to him in the course of his public service.

Seeks Pacific Peril Details

FRANK J. Hogan, chief of Doheny's counsel, sought to have disclosed to the jury full details of the war scare held by the navy in 1921 and 1922 but the court ruled that would be prejudicial to public interests.

Capt. Robison testified that Dr. H. Foster Bain and A. W. Ambrose of the Bureau of Mines and not Fall conducted most of the negotiations for the interior department before the Pearl Harbor contract was let in April, 1922, to the Pan American company. He said the deal almost "hit the rocks" when he urged upon Doheny not to let the navy get bilked after a disagreement with President Anderson of the Pan American Petroleum Co. of California over royalties. Mr. Doheny became excited, Capt. Robison testified, and said if there was any talk of the "bilking" that he would drop the deal then and there. The Pan American proposition was accepted immediately, the witness said.

Dr. Bain, regarded as the principal witness for the defense, was called to the stand Thursday soon after the defense opened their case, or following the giving of character testimony by Karl Leonhardt, and Frank H. Powell, Los Angeles, who had known Doheny many years. Fall's defense statement had just been made to the jury by Frank J. Lambert, chief of the former secretary's counsel. Mr. Lambert's statement contained much of the details of the case as outlined by Mr. Hogan on the second day of the trial, Nov. 23, but he said Fall acted on orders of President Harding and asserted the $100,000 loan of Doheny to Fall had nothing to do with the Pearl Harbor depot contract or the Elk Hills lease.

Considered Test Case

DR. BAIN said Fall had little to do with the working out of details of the contract, saying he and Mr. Ambrose did most of the negotiating for the interior department, together with Judge E. C. Finney, assistant secretary of the interior who was acting secretary in Fall's absence.

Dr. Bain explained the criticism of the Chicago Bridge & Iron Works that it had not been permitted to get a copy of the specifications of the Pearl Harbor project, contending the reason for not allowing that company to bid was because it was unable to take crude oil in exchange for its work.

Under cross examination Dr. Bain said the Standard Oil Co. of California and Associated Oil Co. had refused to bid on the project because they doubted the legality of the exchange of crude for tankage. The Pittsburgh & Des Moines Steel Co., he said, had not received a set of specifications for the same reason as the Chicago company but the Foundation Co. of America had been given a set upon the statement that it had arranged with the Standard Oil Co. of California to take the crude oil.

The bids for Pearl Harbor were opened April 18, 1922, by Acting Secretary Finney in the presence of J. J. Cotter, vice-president of the Pan American, Gano Dunn, president of the J. G. White Engineering Co., and himself, Dr. Bain testified. The bids then were turned over to him and Mr. Ambrose for analysis, he added.

Fall and Sinclair Lose Appeal

WASHINGTON, Dec. 6.—The United States Supreme Court today threw out the protests of Albert B. Fall, former secretary of the interior, and Harry F. Sinclair, chairman, Sinclair Consolidated Oil Corp., against their indictments for alleged conspiracy to defraud the government in the leasing of the Teapot Dome naval reserve in Wyoming to Sinclair. They must stand trial. The Supreme Court upheld rulings of the lower courts in the case.

Under cross examination Dr. Bain said the General Petroleum Corp. and Union Oil Co. officials also had questioned the legality of an exchange of crude oil for tankage.

Considered Test Case

OWEN J. Roberts, who with Atlee Pomerene, constitutes the government's special counsel, read a letter written by Dr. Bain when he was in San Francisco May 12, 1922, to Fall who was in Three Rivers, N. M., in which he told of the doubt of the Pacific oil companies as to the legality of the Pan American deal. Dr. Bain, in the letter, said that none wanted to see Doheny get into trouble and added a proposal had been made to have one of the smaller companies attack the contract in court. The proposal was dropped as some of the companies feared such a suit would give support to trouble makers in Congress.

At one point Dr. Bain referred to quickly corrected himself.

Rear Admiral Luther E. Gregory, chief of the Bureau of Yards and Docks, navy department, testified to details of the plans for the Pearl Harbor supply station. He said the interior department had no part in making the plans. He also said the navy regarded the Pearl Harbor project as necessary to national defense. He said all the tankage is now in and the work was done for less than the cost provided for in the contract of April 25, 1922, with the Pan American.

Mr. Dunn testified to conferences with Doheny relative to cooperating in the Pearl Harbor project. He said the Pan American company's proposals were drafted in the offices of White company but a draft had been worked up by Mr. Cotter. In the Cotter draft was a proviso that in case the Pan American bid were accepted and Naval Reserve No. 1 should be opened that the Pan American would be given a preferential right. Mr. Dunn said he did not then know what was meant by a preferential right.

Following the ruling of Justice Hoehling last Monday which admitted as evidence the testimony before the senate committee on public lands and surveys, this testimony was read by Mr. Roberts. The testimony consisted in part of a letter from Fall to Senator Thomas J. Walsh of Montana, who acted as "prosecutor" in the oil lease investigation, in which Fall said the $100,000 had been loaned him by Edward B. McLean, Washington and Cincinnati newspaper publisher, and a voluntary statement from Doheny that he had loaned the money to Fall to buy

the Harris ranch which adjoined Fall's ranch at Three Rivers.

Daugherty and Chase

ON Tuesday former Attorney General Daugherty testified he had not given an opinion on the legality of the Pearl Harbor contract or the Elk Hills lease. C. C. Chase, son-in-law of Fall, told what he knew of the purchase of the Harris ranch and of the El Paso transactions with the Harris heirs. He denied he had asked Price McKinney, late steel mill operator of Cleveland, to permit his name to be used as Fall's creditor.

Judge Finney, on direct examination, said he advised Fall to accept the Pan American proposal for the exchange of tankage for crude oil and that he signed the contract for the interior department at the telegraphic order of Fall who was in New Mexico.

Col. Theodore Roosevelt, assistant secretary of the navy, described the Pearl Harbor plans as part of the war plans of the navy. He said he did not discuss the oil leases with Secretary Edwin Denby until after they had been made.

As the government drew its case to a close late Thursday it offered testimony of several witnesses and papers in an effort to prove several companies had sought to bid on the Pearl Harbor depot or applied for oil leases without success.

Protests Fall's Action

ONE was a telegram from E. W. Clark, executive vice-president of the Chicago Bridge & Iron Works, a protest previously mentioned. To its protest of April 12, 1922, six days before bids were opened, that it had not been permitted to bid, Secretary Fall answered Mr. Clark in part as follows:

"You are informed that neither this department nor Navy Department has solicited privately or otherwise, bids from any construction companies whatsoever for any oil storage construction at Pearl Harbor or elsewhere. Under the law we are simply compelled to deal directly with oil producers for exchange crude for fuel oil including storage."

Senator J. W. Harreld of Oklahoma told of a letter he had written Fall on Dec. 11, 1922, the day the Elk Hills lease was granted the Pan American, opposing leasing of the California naval reserves except for necessary offset wells but if any leases were to be granted that he would like information concerning the government's plans.

Fall replied that the interior department was acting only as business agent for the navy under direction of the President and that leasing was not left in the sole direction of the interior department. Fall then referred Senator Harreld to the White House.

A request of the Union Oil Co. of California that it be borne in mind if the reserves were to be opened, also was introduced.

90 Per Cent of Service Stations In One Chain Pays Profits

ALTHOUGH the total of competitive service stations in El Paso has doubled, the Calumet Oil Co., El Paso, Texas, is showing operating profit on more than 90 per cent of the number of stations in which it is interested.

Robert N. Mullin, president of the Calumet, told the Texas Independent Oil Men's Association at its fourth annual convention in San Antonio that the system he follows is responsible for the showing being made.

It is the Calumet's policy to put in charge of stations men who like to work for themselves. These men pay their own help and mainly work out their own problems, getting a commission from the Calumet of 1 cent a gallon on gasoline and 50 per cent on lubricant sales. The station men may sell accessories, do vulcanizing, etc., in which part of the business the Calumet has no share.

In arranging for sites the Calumet estimates how much gallonage a location is capable of producing under the station management of a good man. Then a building of the knockdown type is erected and the grounds improved to make them attractive without the station investment being too high. Buildings that will salvage 25 per cent, or more, are used. It is the intention of the Calumet to write off station and equipment costs 75 per cent during the life of the lease.

Station Man Posts Bond

WHEN a man is placed in charge of a station he puts up a bond of $200 or $250, on which the Calumet pays 8 per cent interest. This bond protects the Calumet's goods at the station.

The station manager has the advantage of the Calumet's credit system, which has been so expanded to permit the operator to sell accessories, and other articles. Credit is handled by the company. Credit sales are applied as cash toward the station manager's account with the Calumet, except that on accessories, etc. a handling charge of 5 per cent is made.

A card system is used on credits, so arranged that a customer's card is immediately picked up when his charge allowance is exceeded. A station manager may recommend credit, but the Calumet's sales manager decides.

Stations are kept spick and span and equipment in order by Calumet's men. These include a sign painter, a house painter and a mechanic. The Calumet also pays for electric lighting, water and minor expenses.

A written contract which recites simple rules of operation, is used by Calumet to control proper operating conditions and its own standard of merchandising. Under this contract it is possible to terminate the company's arrangement with a station manager whenever desirable. The manager also may withdraw if he sees fit.

Young Married Men Preferred

MR. MULLIN said that he tried generally to get young married men to handle stations, because "if they are married they have to work and if they are young they have the pep." Sometimes he has trouble getting good men, he said, but not so much lately, as formerly.

Mr. Mullin said that under his system service stations "got by" nicely in comparison with the old rental system which wouldn't pay at similar locations. The amount of vulcanizing that can be made to pay is surprising, he said.

Included under Mr. Mullin's station system is the policy of holding sales conferences every Tuesday afternoon. Formerly these conferences were in the form of "night schools," but the men would be tired and show less interest than they do under the present system. Arrangements are made for station relief work while the men in charge attend the conferences. To graduate from the sales conference meetings it is necessary for station managers to attend four consecutive sessions.

The sales conference system was begun, Mr. Mullin said, shortly after he heard one of the men talking learnedly about the "specific gravity" of gasoline.

Men are Encouraged

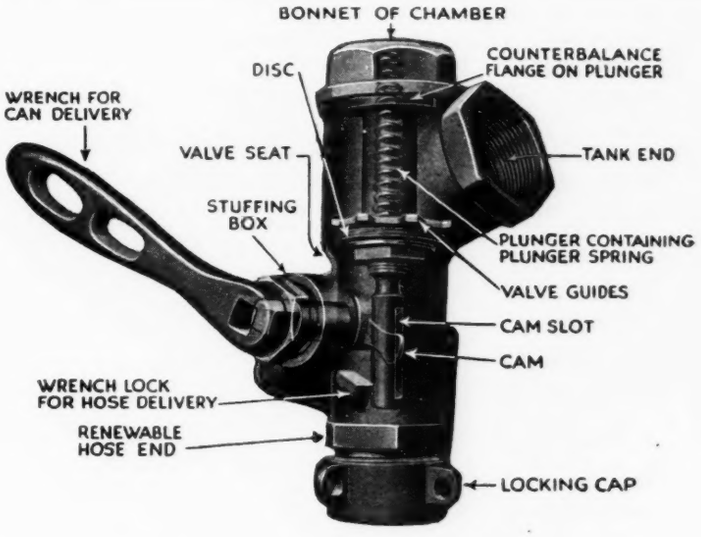
IN a discussion from the floor of the convention, which followed Mr. Mullin's remarks about his system, J. R. Klumpp, in charge of station sales for the Grayburg Oil Co., San Antonio, spoke in favor of encouraging men to develop salesmanship.

C. V. Millican, Panhandle Refining Co., Wichita Falls, referred to the success obtained in operating stations with better type men who are paid higher wages than the personnel with which some companies operate.

The Panhandle has also been fortunate, Mr. Millican said, in getting a number of good station sites on a 1 cent a gallon rental basis instead of paying the old flat rate for leases. Portable buildings are used by the Panhandle in the territory around Wichita Falls where it operates stations. Leases are generally taken for periods of eight to ten years.

J. C. Gaither, Gaither Oil Co., Fort Worth, said his company paid 1 cent a gallon rental in some cases and 10 cents a gallon on lubricant sales.

Ordinarily gallonage rentals have worked out satisfactorily for both the Panhandle Refining Co., and the Gaither Oil Co., the speakers said. Mr. Gaither, however, cited one instance where he had subleased to a dealer and both he and the landlord lost money through the dealer's dishonesty.



It's Counterbalanced!

WHEATON FAUCETS are recognized as the highest quality faucets on the market—a distinction earned by twelve years of unmatched service. Is it any wonder, then, that this Wheaton No. 24, with such a family reputation back of it, should be so much in demand?

You will observe the counterbalance flange on the upper end of the plunger shown in the illustration above. This flange *slows* the shut-off action. Also when the valve closes —when the plunger goes down—the chamber above the counterbalance flange must fill, and to do so the liquid must pass between the close-fitting flange and the chamber walls. This further slows the shut-off action. Together, these features make the Wheaton No. 24 the smoothest, easiest operating faucet ever developed. And, not only does this slow action relieve the faucet and connections of jar, it adds life to the valve disc.

Two styles of wrenches are made—one for can delivery which the driver must hold and one for hose delivery which the driver must lock open. Send for sample of either the 1½″ or 2″ size of this Wheaton No. 24 and give it your own test.

A. W. WHEATON BRASS WORKS, NEWARK, N. J.

Wheaton

Compilation Of Mid-Continent Refinery Operations

All Rights Reserved to National Petroleum Publishing Co.

National Petroleum News

Mid-Continent Refinery Operations Week Ended Dec. 3 (By Telegraph)

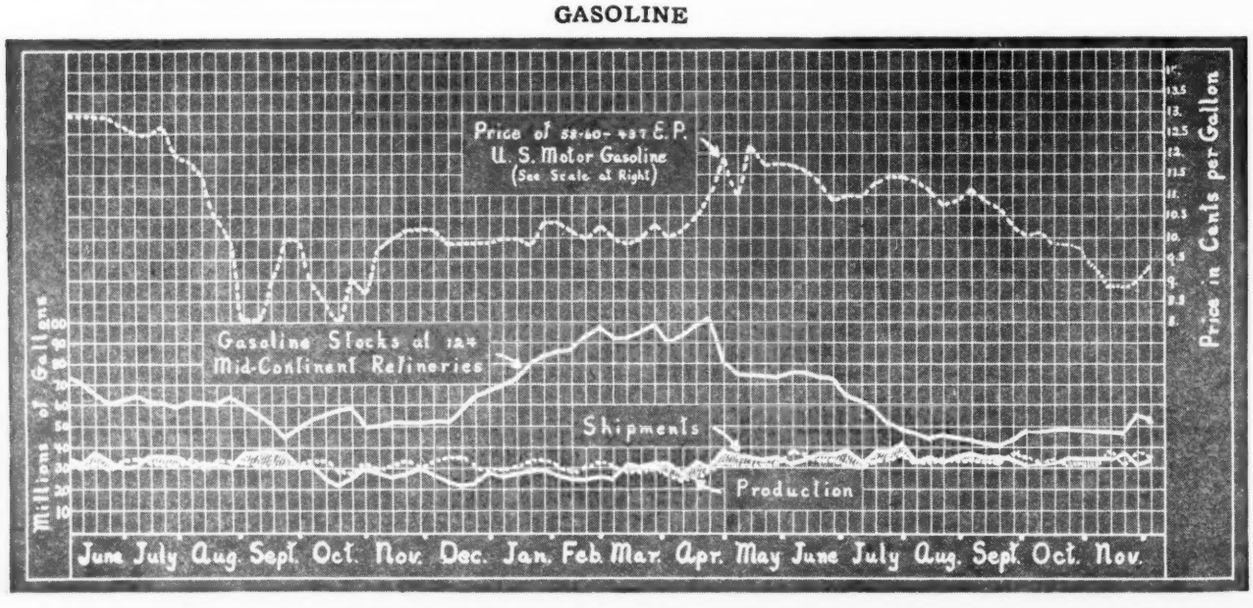
	Kansas	Oklahoma	North and Cent. Texas	North La.-Ark.	Total Week Ended Dec. 3	Total Week Ended Nov. 5
Plants Reporting	23	46	41	14	124	124
Crude Cap. (Bbls.)	98,200	165,900	144,300	53,700	484,100	462,100
Cracking Capacity	21,000	45,800	15,700	20,200	102,750	102,750
Da. Av. Crude Runs	60,202 — 3.4	100,497 + 3.2	69,000 +14.7	55,585 + 3.9	285,284 + 4.4	273,597
Da. Av. Other Oils	5,554 +65.7	3,346	5,508 +18.1	6,264 +400.7	20,672 +144.4	14,463
GASOLINE—Gallons						
Stocks Nov. 26	9,266,127	31,923,577	9,183,731	2,688,650	53,062,085	49,480,833
Prod. 11-26 to 12-3	8,804,539 — 1.9	14,397,999 — 5.6	7,722,378 + 7.8	3,323,406 — 8.8	34,248,322 — 2.3	32,919,925
Ship. 11-26 to 12-3	8,853,551 — 1.3	13,604,431 + 23.2	8,052,263 +13.4	3,345,116 — 6.1	33,855,361 + 10.4	34,279,064
Stocks Dec. 3	9,217,115 — 0.5	32,717,145 + 2.5	8,853,846 — 3.6	2,666,940 — 0.8	53,455,046 + 0.7	48,121,094
Ratio Sales to Prod.	100.6%	94.5%	104.3%	100.7%	98.9%	104.1%
KEROSENE—Gallons						
Stocks Nov. 26	3,279,202	5,273,066	2,148,515	500,658	11,201,441	10,622,166
Prod. 11-26 to 12-3	1,788,847 + 8.8	1,810,416 — 7.1	2,227,285 +30.6	413,357 — 1.0	6,239,905 + 9.2	6,357,918
Ship. 11-26 to 12-3	1,530,013 —10.1	1,542,986 — 22.8	1,995,848 + 2.3	441,455 + 39.1	5,510,302 — 7.7	5,992,602
Stocks Dec. 3	3,538,036 + 7.9	5,540,496 + 5.1	2,379,952 +10.8	472,560 — 5.6	11,931,044 + 6.5	10,987,482
Ratio Sales to Prod.	85.5%	85.2%	89.6%	6.8%	88.3%	94.3%
STOVE DISTILLATE—Gallons						
Stocks Nov. 26	5,771,360	6,374,069	1,248,154	282,467	13,676,050	13,686,640
Prod. 11-26 to 12-3	832,427 —17.3	578,140 — 25.3	298,762 +23.0	56,969 — 9.1	1,766,298 — 15.3	2,555,246
Ship. 11-26 to 12-3	1,001,204 — 3.8	862,433 — 11.7	552,252 + 8.3	91,577 +562.7	2,507,466 — 1.3	1,890,155
Stocks Dec. 3	5,602,583 — 2.9	6,089,776 — 4.5	994,664 —20.3	247,859 — 12.3	12,934,882 — 5.4	14,351,731
Ratio Sales to Prod.	120.3%	149.2%	184.8%	160.7%	142.0%	74.0%
GAS OIL—Gallons						
Stocks Nov. 26	6,173,271	30,389,344	9,899,249	3,215,653	49,677,517	55,441,035
Prod. 11-26 to 12-3	1,222,775 + 1.4	2,529,733 +252.4	1,963,490 +40.0	3,016,535 + 7.5	8,732,533 + 42.4	9,331,107
Ship. 11-26 to 12-3	1,910,205 +19.0	2,428,738 + 70.2	4,182,170 +50.7	3,037,999 + 23.8	11,559,112 + 39.9	10,552,175
Stocks Dec. 3	5,485,841 —11.1	30,490,339 + 0.3	7,680,569 —22.4	3,194,189 — 0.7	46,850,938 — 5.7	54,219,967
Ratio Sales to Prod.	156.2%	96.0%	213.0%	100.7%	132.4%	113.1%
FUEL OIL—Gallons						
Stocks Nov. 26	14,035,764	69,012,576	12,383,304	10,784,985	106,216,629	105,648,171
Prod. 11-26 to 12-3	5,293,848 — 4.9	6,854,087 + 4.6	8,530,182 + 1.7	8,908,236 + 6.8	29,586,353 + 2.5	26,838,191
Ship. 11-26 to 12-3	6,288,769 + 9.8	8,375,678 + 1.4	8,695,342 + 1.1	10,565,760 + 41.4	33,925,549 + 12.9	26,775,864
Stocks Dec. 3	13,040,843 — 7.1	67,490,985 — 2.2	12,218,144 — 1.3	9,127,461 — 15.4	101,877,433 — 4.1	105,710,498
Ratio Sales to Prod.	118.8%	122.2%	101.9%	118.6%	114.7%	99.8%

Gasoline Produced by Various Methods, Week Ended Dec. 3

	Kansas	% of Total	Oklahoma	% of Total	Texas	% of Total	Louisiana-Arkansas	% of Total	Total	% of Total
Straight Run	6,023,020	68.4	9,902,750	68.8	6,471,029	83.8	1,212,511	36.5	23,609,310	68.9
Cracked	2,273,949	25.8	3,788,599	26.3	1,104,013	14.3	1,827,101	55.0	8,993,662	26.3
Natural	507,570	5.8	706,650	4.9	147,336	1.9	283,794	8.5	1,645,350	4.8
Total	8,804,539		14,397,999		7,722,378		3,323,406		34,249,322	

+ or — columns are % change over previous week.

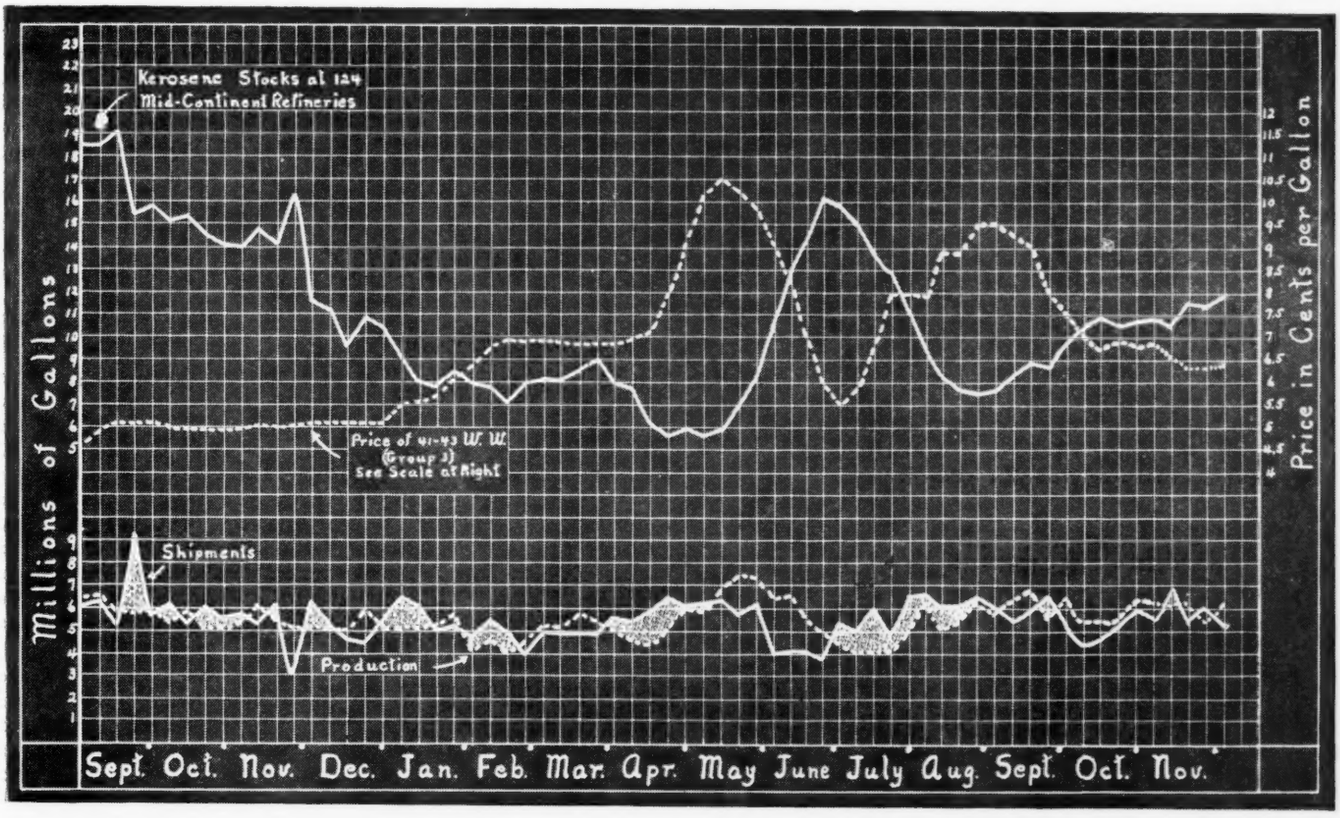
GASOLINE


Price of 58-60- 437 E.P.
U. S. Motor Gasoline
(See Scale at Right)
Gasoline Stocks at 124
Mid-Continent Refineries
Shipments
Production
Millions of Gallons
Price in Cents per Gallon
June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov.

Barometer of Mid-Continent Refinery Market—Week Ending Dec. 3

Charted Course of Prices, Production, Shipments, Stocks of Principle Refined Products, Week by Week, From Reports Made by 124 Plants to National Petroleum News

KEROSENE


Kerosene Stocks at 124 Mid-Continent Refineries
Price of 41-43 W. W. (Group 3) See Scale at Right
Shipments
Production
Millions of Gallons
Price in Cents per Gallon
Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov.

More Light and Less Heavy Oil in Storage

Staff Special—By Telegraph

TULSA, Dec. 7

GASOLINE production for the week ended Dec. 3 was reduced approximately 700,000 gallons while shipments increased 3,200,000 gallons at 124 Mid-Continent refineries reporting weekly operations to National Petroleum News. However, gasoline stocks were increased 400,000 gallons during the week.

Recent export buying in both Oklahoma and Texas was reflected in the reports. Oklahoma refiners increased shipments 2,600,000 gallons over the previous week while the north Texas group increased shipments approximately a million gallons. Production of gasoline in both areas was reduced slightly. Kansas refiners showed practically no change in shipments while the Louisiana-Arkansas group was off slightly.

Crude charges were increased 12,000 barrels daily average while charges of other oils were more than doubled. Kansas refiners reduced crude charges 2000 barrels and increased other oil charges 2000 barrels. Oklahoma refiners increased crude runs 3000 barrels and other oil charges over 4000 barrels. Texas increased crude runs 9000 barrels and other oil charges, 1000 barrels, while the Louisiana-Arkansas plants increased crude runs 2000 barrels and other oil charges 5000 barrels.

Kerosene production increased in Kansas and Texas sufficiently to cause a net increase of 525,000 gallons in the field while shipments dropped off 300,000 gallons causing an addition of approximately 700,000 gallons to stocks.

Stove distillate production was off 300,000 gallons while shipments were practically stationary, being approximately 750,000 gallons greater than production.

Despite an increase of 2,600,000 gallons in gas oil production during the week shipments more than kept pace by increasing 3,200,000 gallons causing a net reduction in stocks on hand of 2,800,000 gallons. All areas shared in the increased movement of gas oil.

Fuel oil shipments also showed considerably better movement during the week with an increase of approximately 4,000,000 gallons. Production meanwhile was increased only 700,000 gallons over the previous week with the result that stocks on hand were reduced 4,300,000 gallons to a total of 101,877,443 gallons.

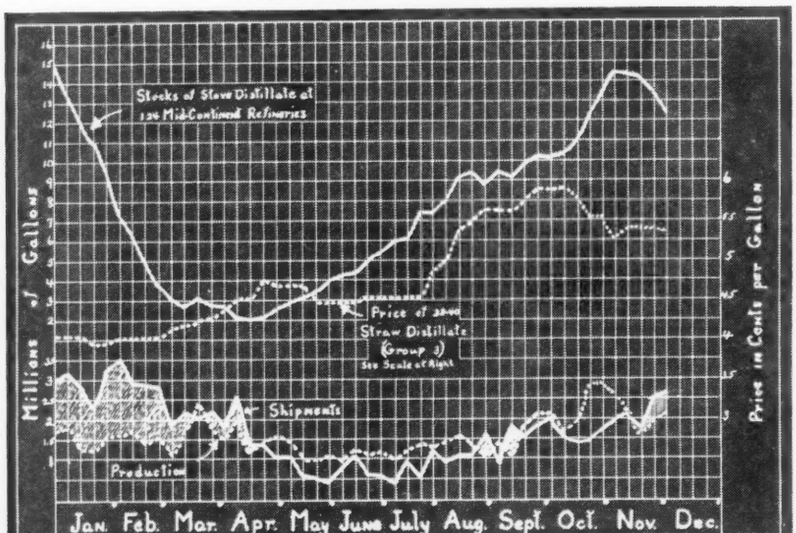
Summary for the Month

Production and shipments, all reporting refineries, for four weeks ended Dec. 3. Change in stocks figured from Nov. 5.

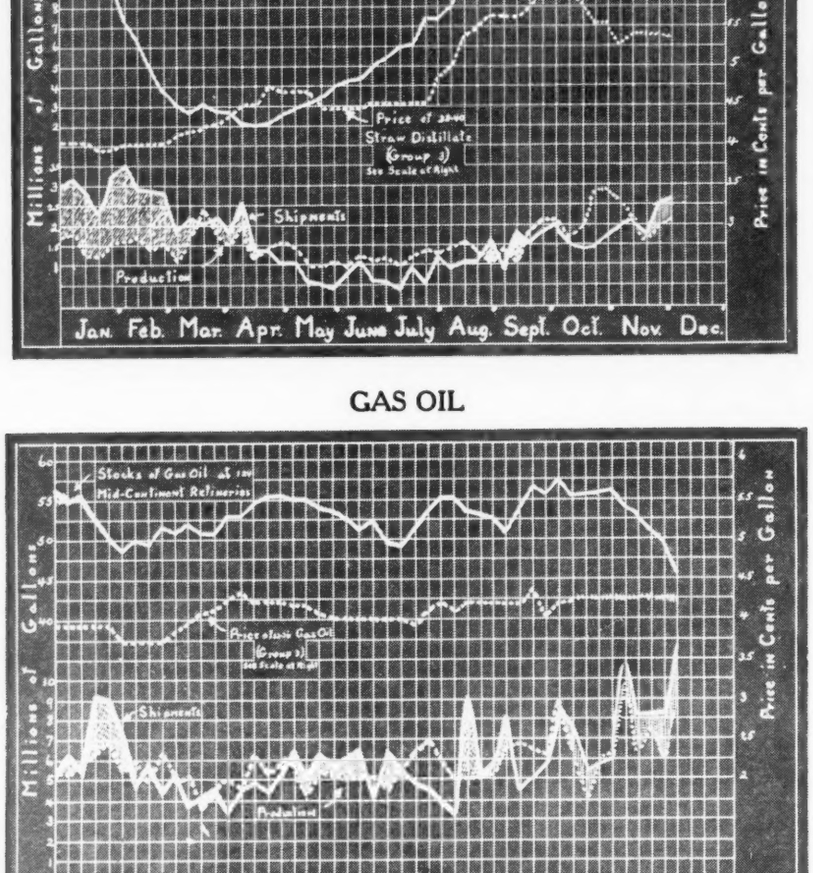
	Gallons
Gasoline	
Production	143,204,361
Shipments	137,871,009
Net change in stocks	+5,333,352
Ratio sales to production	96.3%
Kerosene	
Production	24,264,995
Shipments	23,321,433
Net change in stocks	+943,562
Ratio sales to production	96.1%
Stove Distillate	
Production	7,532,223
Shipments	8,949,072
Net change in stocks	—1,416,849
Ratio sales to production	118.8%
Gas Oil	
Production	28,769,595
Shipments	36,138,624
Net change in stocks	—7,369,029
Ratio sales to production	125.6%
Fuel Oil	
Production	118,658,086
Shipments	122,491,151
Net change in stocks	—3,833,065
Ratio sales to production	103.2%

Barometer of Mid-Continent Refining Market—Week Ending Dec. 3.

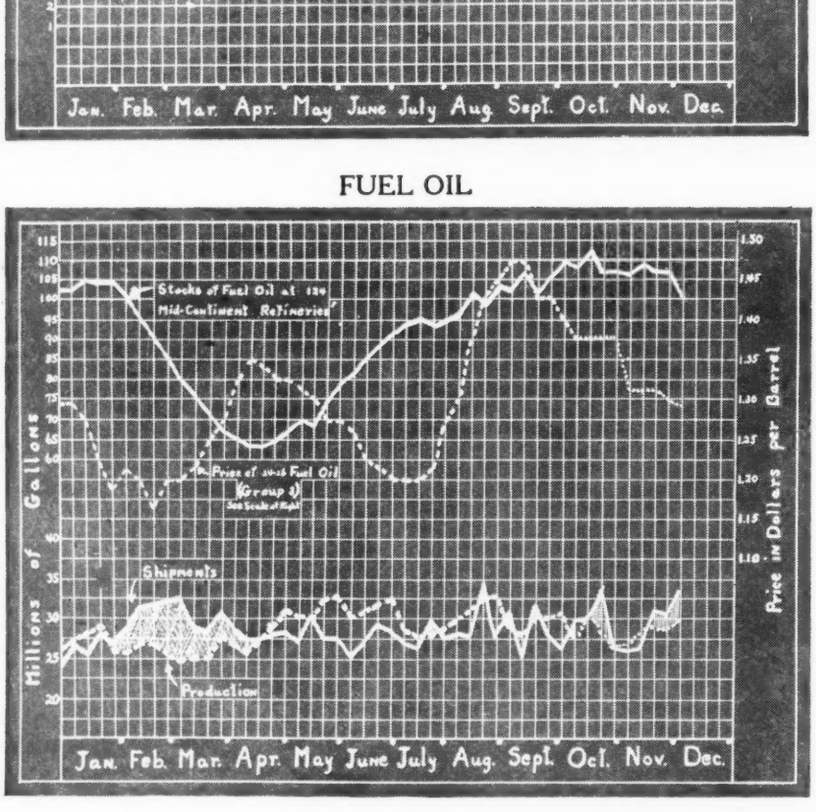
STOVE DISTILLATE


Stocks of Stove Distillate at 124 Mid-Continent Refineries
Price of 28-66 Straw Distillate (Group 3) See Scale at Right
Shipments
Production
Millions of Gallons
Price in Cents per Gallon
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

GAS OIL


Stocks of Gas Oil at 124 Mid-Continent Refineries
Price of 36-40 Gas Oil (Group 2)
Shipments
Production
Millions of Gallons
Price in Cents per Gallon
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

FUEL OIL


Stocks of Fuel Oil at 124 Mid-Continent Refineries
Price of 26-36 Fuel Oil (Group 2) See Scale at Right
Shipments
Production
Millions of Gallons
Price in Dollars per Barrel
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

Automobile Production Continues to Recede

NEW YORK, Dec. 4.—Automotive Industries this week will say:

November automobile and truck production was under October and the decline is expected to continue this month, on the basis of schedules already laid out. However, the downward trend has been pursued gradually, and does not represent drastic curtailment in any sense. The industry is taking care of its dealers in a season which has shown somewhat more than the usual recession in retail demand, and will be in good condition to resume active operations with the opening of the 1927 market.

The most urgent cause of concern just now is the state of used car stocks. These have mounted rapidly in the last few months, and represent a good deal of burden for retailers. Special sales of the vehicles are being advertised in some sections, and they often carry offers of low down-payment financing arrangements, although experience has shown that from 5 to 10 per cent of used cars financed on less than 40 per cent down are repossessed.

Inventories of manufacturers are within reasonable bounds and it is hoped and expected that in the period of comparatively low production the retail end will be enabled to cut down used car stocks.

Deepest Hole in World Has Oil Showing

LOS ANGELES, Dec. 4.—Preliminary tests of the Chanslor-Canfield-Midway Oil Co.'s, Olinda 96 in Orange County, Calif., the deepest hole in the world, showed the presence of some oil and gas late this week.

A string of 4½ inch had been landed at the bottom of the hole with the last 2,000 feet perforated, and now they are cementing the hole through perforations at about 6,200 feet for a real test. The hole is full of water.

The bottom of the hole is at 8,046 feet, and last cores were taken from below 8,000 feet. This test is being watched with much interest, as the drilling of the well established several world records, and if it is a producer, it will establish other records.

Electric power was used to drill the hole.

H. D. Peckham Joins Crystal

SHREVEPORT, LA., Dec. 4.—H. D. Peckham, who for the last eight years has been with the Pure Oil Co. in the Arkansas district, has joined the Crystal Oil Refining Corp. as scout for north Louisiana and Arkansas. Mr. Peckham is a native of Rhode Island and a graduate of Allegheny College.

Salesman Starts Educational Program For Big Group 3 Refiner

By Ward K. Halbert
N. P. N. Staff Writer

CHICAGO, Dec. 4

BEING called upon to make a speech in a well-filled banquet hall when no speech has been prepared and there is no burning issue about which a speech should be made is a memorable event in the life of almost any man. Especially if that man never made an extemporaneous talk in his life, knows very well he is not an orator and never hoped to be distinguished as a platform entertainer. An incident like that in Davenport, Ia., last spring proved to be the turning point in the business career of L. V. Surtees, salesman on the staff of Cosden Sales Corp., Chicago. So well did he avail himself of his unexpected opportunity that he received more invitations to talk than he could fill this season. The past summer he delivered 25 addresses to gatherings of oil salesmen in six states. In the mean time he went right along with his sales work.

Surtees was in Davenport calling on a customer. After transacting his routine business he asked his prospect to accompany him to dinner.

"No," the customer said. "We are having a little meeting of our salesmen, tank truck men, station men and a few good customers at the hotel tonight. There will be refreshments. Suppose you join me there."

"Are you sure I won't be in the way?" Surtees inquired.

At 6:30 p.m. he found himself seated behind a plate at the board where the sales force of the Arrow Petroleum Co. was about to banquet. After dessert was served the toastmaster told the boys that the man at his right was L. V. Surtees of Cosden Sales Corp., who would now address them. After considerable slight-of-hand work with water glass and napkin, Surtees managed to balance himself in an upright position.

Had Something To Tell

FIRST came Surtees' sales talk, somewhat elaborated. Then he started talking about oil. He is a graduate of Oklahoma A. & M. He spent six years in the Cosden refinery in West Tulsa, serving in almost every capacity from sample boy up. He was two years in charge of the laboratory, spent a year in experimental work and started selling oil two years ago. He had something to tell and told it.

When he finished the men started asking him questions. They asked him what crude oil was; how various crudes differ, and what the difference is between high-test and low-test gasoline. They asked about the significance of

L. V. Surtees

the color of gasolines; what cracking was, and the meaning of I. B. P. and E. P., and what caused water in the crank case, and what made bearings burn out.

Surtees was at home answering intelligent questions about petroleum products. The management was delighted with the discussion and the report of the meeting spread and Surtees was established as a public speaker. He has not addressed jobbers' meetings many times. Most of his appearances have been before meetings of salesmen employed by one firm. They have been gatherings of not less than eight or ten and seldom more than 100 men. Twenty or 30 men make the best meetings, he says.

A Much Needed Work

OIL men who have heard him say he is doing a work that is needed greatly in the oil marketing industry. "He does not get technical and talk over the heads of men with common school education," they say, "yet he is a refinery man and a chemist which enables him to give the men facts and not bunk." Surtees modestly says his chief qualification is being a stranger to his hearers. Men are more disposed to listen to somebody from "off yonder."

Now Cosden Sales Corp., is starting to make a permanent institution of Surtees' work. It is preparing a film for his "Chautauqua" work. At the instance of John M. Carson, president of the firm, Surtees spent a week in the Mid-Continent with a moving picture camera, filming things that he can more easily show than tell in words.

The pictures show oil field operations, flowing wells, pumping wells and drilling wells. They show a crew of men laying a pipe line and they include a panoramic view of the famous Burbank field. There are many views of refinery operations, from firing furnaces to testing gasoline in the laboratory and filling cars at the loading rack.

The only place the name of the company appears in the picture is on the tank cars. The purpose of the movement is to educate the oil jobbers' employees, who are the oil industry's personal contacts with the consuming public. The oil industry will be better understood by the public, the management thinks, when the public's serious questions to the man on the wagon or at the pump begin to be answered correctly.

If an oil consumer wants to ask a question about oil, the natural person for him to ask is the man who sells him the oil. In too many cases, Mr. Surtees says, the salesmen are not able to answer these questions correctly and often they do the easiest thing and make up any sort of an answer to relieve the situation. He relates this story in illustration:

Not long ago a motorist observed a new pump and a new brand of gasoline at the station of an independent jobber. Halting in front of the new pump the motorist asked:

"What is the flash on this high-test gasoline?"

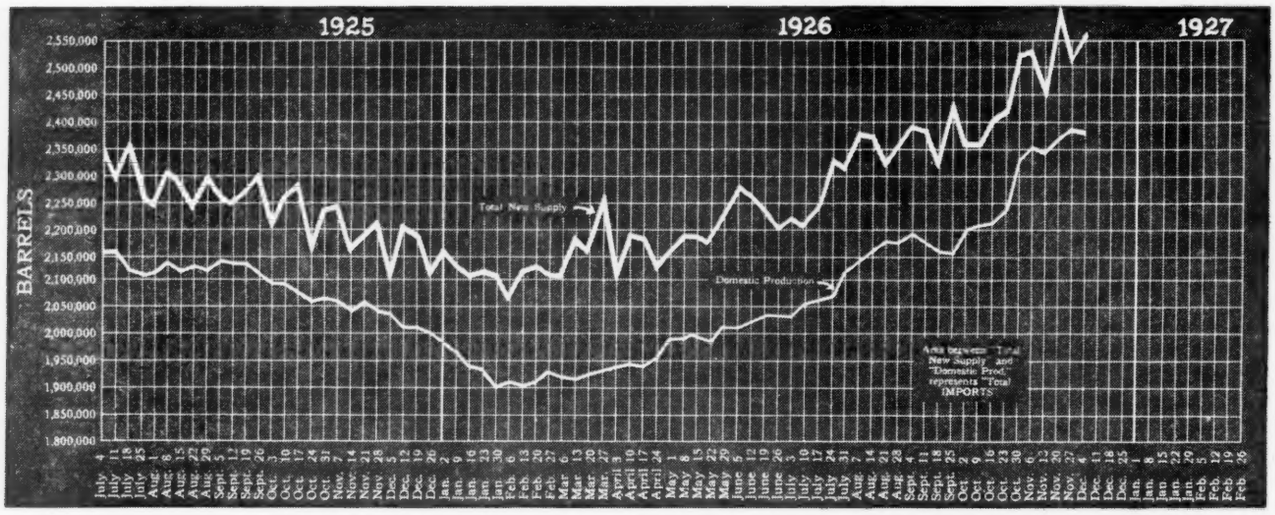
"One hundred foot per second," replied the pump boy, having no idea himself what flash point might be.

"Good. Fill 'er up," said the customer.

Prairie Plans Gas Lifts In Mid-Continent

TULSA, Dec. 4.—C. C. Carlisle, of the Prairie Oil & Gas Co., who has had charge of that company's gas-lift installations in the Lost Soldier field, Wyoming, is in Tulsa for an indefinite period. His company is planning the installation of gas lift plants on a number of its Mid-Continent properties. Hugh M. Kent, formerly of the U. S. Bureau of Mines, will be engaged in this work for the Prairie.

Daily Average Crude Oil Production and Imports



Daily average gross output of United States, by fields, for week ending with dates given below, as compiled by American Petroleum Institute.

Production Summary

	Dec. 4	Nov. 27
Production East of the Rockies	1,730,500	1,737,350
Decrease		6,850
Total Production in U. S.	2,388,800	2,391,250
Decrease		2,450
Crude Oil Imports	165,000	137,143
Increase		27,857
Total Crude Supply	2,553,800	2,528,393
Increase		25,407

OKLAHOMA

North Braman	26,400	29,100
South Braman	5,100	5,550
Blackwell	3,750	3,750
Hubbard	3,300	2,650
Thomas	2,200	2,250
Tonkawa	30,750	31,250
Garber	24,350	23,350
Burbank	44,500	44,250
Osage, outside Burbank	34,950	34,400
Watchorn	3,400	3,400
Cushing	21,400	21,400
Yale Jennings	12,800	13,200
Davenport	4,950	5,050
Bristow-Slick	26,900	26,850
North Okmulgee	17,400	17,400
Lyons-Deaner	4,050	3,900
Stroud	1,950	1,950
Cromwell	14,300	14,650
Papoose	9,100	9,250
Wewoka	24,350	24,300
Seminole	112,300	111,050
Duncan district	7,100	7,100
Graham	8,950	8,900
Fox	1,900	1,950
Healdton	15,000	15,000
Scholem-Alechem	9,000	9,050
Hewitt	11,000	10,950
Others	66,750	66,500
Total Oklahoma	547,900	548,400
Decrease		500

KANSAS

Greenwood County	45,150	44,900
Florence-Covert	1,900	1,900
Peabody-Elbing	4,100	4,100
Eldorado-Towanda	13,550	13,550
Augusta-Fox-Bush	4,950	4,950
Rainbow Bend	3,350	3,300
Russell	4,200	4,300
Churchill	11,850	10,600
Others	30,100	30,000
Total Kansas	119,150	117,600
Increase		1,550

NORTH LOUISIANA

Homer	5,400	5,450
Haynesville	8,800	8,750
Caddo, light	10,150	10,150
Caddo, heavy	5,200	5,000
De Soto, Red River	4,200	4,100
Elm Grove	550	600
Bellevue	1,700	1,700
Cotton Valley	6,750	6,900
Urania	13,100	13,800
Total N. Louisiana	55,850	56,450
Decrease		600

ARKANSAS

El Dorado	6,700	6,650
Smackover, light	13,300	13,300
Smackover, heavy	110,800	111,750
Stephens	1,550	1,550
Nevada	1,800	1,900
Lisbon	6,450	6,600
Total Arkansas	140,600	141,750
Decrease		1,150

NORTH TEXAS

Burkburnett	14,600	14,300
Electra	16,900	16,950
Iowa Park and K-M-A	4,950	4,500
Wilbarger	15,850	15,550
Montague-Cooke counties	12,300	11,850
Hutchinson county	145,100	148,350
Balance Panhandle	13,900	13,950
Archer county	25,200	34,800
Others	1,300	1,300
Total North Texas	260,100	261,550
Decrease		1,450

EAST CENTRAL TEXAS

Mexia	11,250	11,300
Currie	800	800
Richland	1,450	1,400
Corsicana-Powell	24,350	24,150
Wortham	6,150	6,200
Nigger Creek	10,950	11,450
Total East Central Texas	54,950	55,300
Decrease		350

WEST CENTRAL TEXAS

Stephens County	11,000	10,950
Eastland County	5,900	5,850
Desdemona	1,700	1,700
Young County	8,800	8,500
Brown County	16,950	16,600
Palo Pinto County	450	450
Callahan County	3,700	3,500
Shackelford County	14,850	14,400
Reagan County	29,450	30,250
Coleman County	500	500
Crane and Upton Counties	22,350	23,500
Mitchell-Scurry Counties	3,600	4,000
Others	5,550	4,750
Total West Central Texas	124,800	124,950
Decrease		150

SOUTHWEST TEXAS

Luling	19,650	19,650
Laredo District	16,900	16,700
Somerset	1,950	1,950
Lytton Springs	3,150	3,150
Piedras Pintas	450	300
Others	600	550
Total Southwest Texas	42,700	42,300
Increase		400

GULF COAST

Goose Creek	7,600	7,750
Hull	21,100	20,200
Saratoga	1,250	1,250
Blue Ridge	5,050	3,100
Damon Mound	1,050	1,100
Batson	1,700	1,650
West Columbia	9,650	9,650
Humble	4,400	4,400
Pierce Junction	6,400	6,950
Sour Lake	5,700	5,700
Spindletop	84,750	90,550
Orange County	7,250	7,300
Edgerly	800	750
Evangeline	1,150	1,100
Vinton	6,100	6,050
Lockport	3,950	4,100
South Liberty	4,550	4,850
Big Creek	1,400	4,350
Boling	2,550	2,150
Others	2,400	2,600
Total Gulf Coast	178,800	185,550
Decrease		6,750

ROCKY MOUNTAIN

WYOMING

Salt Creek	45,950	42,200
Grass Creek	3,150	3,100
Elk Basin	800	800
Big Muddy	3,100	3,100
Lost Soldier	5,100	5,150
Rock River	2,800	2,800
Teapot Dome	1,250	700
Lance Creek	750	750
Others	2,000	2,050
Total Wyoming	64,900	60,650
Increase		4,250

MONTANA

Cat Creek	2,600	2,550
Sunburst	14,000	14,000
Others	200	200
Total Motana	16,800	16,750
Increase		50

COLORADO

Moffat (Craig)	3,150	3,100
Fort Collins	3,550	3,800
Florence	450	450
Others	600	700
Total Colorado	7,750	8,050
Decrease		300

NEW MEXICO

Artesia	2,300	3,000
Hogback	650	700
Table Mesa	250	450
Rattlesnake	2,000	2,400
Total New Mexico	5,200	6,550
Decrease		1,350
Total Rocky Mountain	94,650	92,000
Increase		2,650

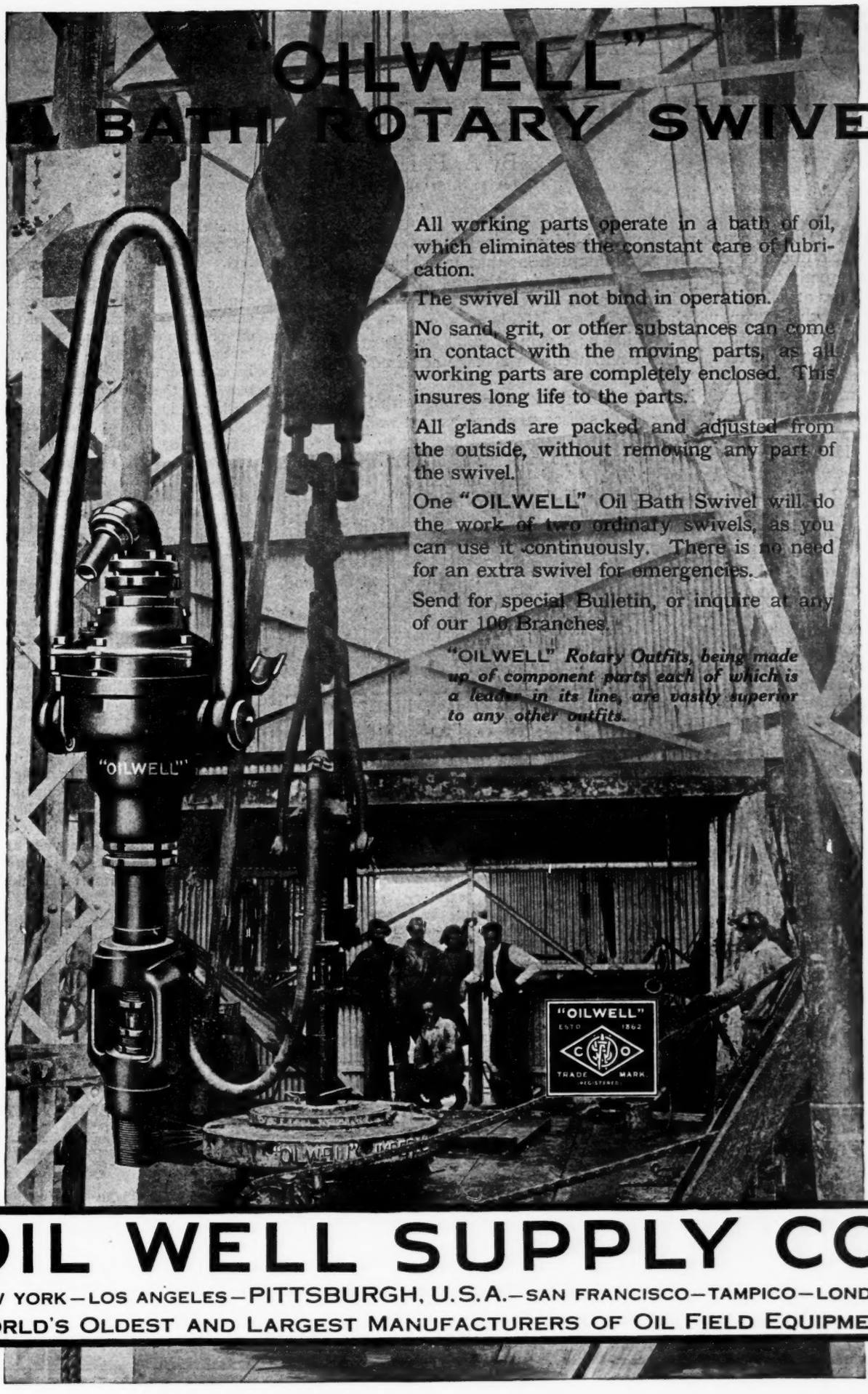
CALIFORNIA

Santa Fe Springs	45,500	45,500
Long Beach	96,500	97,000
Huntington Beach	85,000	83,000
Torrance	26,500	26,500
Dominguez	19,500	20,000
Rosecrans	13,500	14,500
Inglewood	40,000	40,000
Midway-Sunset	94,000	94,000
Ventura Avenue	56,800	56,200
Seal Beach	8,000	8,200
Others	173,000	169,000
Total California	658,300	653,900
Increase		4,400

EASTERN

(Including Ill., Ind., Ky., Ohio, W. Va., Pa., and N. Y.)	111,000	111,500
Decrease		500

"OILWELL" OIL BATH ROTARY SWIVEL



All working parts operate in a bath of oil, which eliminates the constant care of lubrication.

The swivel will not bind in operation.

No sand, grit, or other substances can come in contact with the moving parts, as all working parts are completely enclosed. This insures long life to the parts.

All glands are packed and adjusted from the outside, without removing any part of the swivel.

One "OILWELL" Oil Bath Swivel will do the work of two ordinary swivels, as you can use it continuously. There is no need for an extra swivel for emergencies.

Send for special Bulletin, or inquire at any of our 100 Branches.

"OILWELL" *Rotary Outfits, being made up of component parts each of which is a leader in its line, are vastly superior to any other outfits.*

OIL WELL SUPPLY CO.

NEW YORK—LOS ANGELES—PITTSBURGH, U.S.A.—SAN FRANCISCO—TAMPICO—LONDON

WORLD'S OLDEST AND LARGEST MANUFACTURERS OF OIL FIELD EQUIPMENT

Earlsboro Discovery Making 10,000 Bbls.; Seminole Output Increases

By A. F. Hinton
N. P. N. Staff Writer

TULSA, Dec. 4

OKLAHOMA crude production held practically stationary the past week, in contrast to the rapid fluctuations that have characterized its course recently. Its daily average this week is estimated by National Petroleum News at 547,615 barrels, a decrease of 500 barrels from the preceding week. North Braman, which fell off about 3100 barrels, was the largest factor, but its loss was offset somewhat by a gain of 2200 barrels at Burbank, this resulting from completion of new wells on acreage acquired at the last Osage sale.

Earlsboro apparently is destined to take its place along with Seminole as a major pool, if it is to be judged by its discovery well, as that well was deepened again a day or two ago, and at last reports was flowing 490 barrels an hour. This production, if maintained, would amount to 11,760 barrels a day, and makes this well look as large as any ever drilled in Seminole. The latest deepening of this well, which is the Gypsy-Amerada-Westland No. 1 School, in the NEc of 16-9-5, was four feet, making total depth 4291 feet, in the Wilcox sand topped at 4275 feet. Last week it was deepened five feet and increased its production from 2500 to 6500 barrels. About 40 wells are now drilling around this big producer, and all will be rushed down to the sand, urged on by the increasing output of the discovery well.

Seminole, which had another variable week, divided between large new completions and death of older wells, managed to raise its production about 1100 barrels to a daily average of 112,265 barrels for the week. It ended the week making better than 118,000 barrels, and in a few days probably will have passed its peak figure, which was 120,000 barrels, reached late in October. Other fields than those mentioned showed only minor changes during the week, most of them declining slightly.

Two Oklahoma Wild Cats

CONSIDERABLE interest was aroused by reported oil showings in wildcat wells far removed from present production, one near Oklahoma City and the other out in Major county, about 75 miles west of Enid. Investigation has disclosed, however, that neither well amounts to much in its present status, especially the one in Major county. These two "flashes" constituted the news that developed in Oklahoma during the week, outside of the Seminole district, and that area remains the point of principle interest and greatest activity.

The Oklahoma City wildcat is the J. I. Cromwell No. 1 Martin, in the SWc NE SW SE of 10-12-3W, Oklahoma county, and only a short distance north of the capitol. This well apparently had a small showing of oil at depth of 4378 feet. The oil appeared on top of 4300 feet of water in the hole, this water coming from an upper formation, and until a water shut off has been made it will be impossible to gauge the importance of the oil showing. The pipe will be lowered to bottom, which necessitates about 200 feet of underreaming, so it will be some time before more definite information is available. It has not been determined what formation the well is in at its depth, but geologists state that the Wilcox sand in this locality probably would be below 6000 feet.

The Major county wildcat caused considerable talk and some speculation when first reported, but when the larger oil companies had had opportunity to investigate it, they did not attach any importance to it. This well, which is known as the Henry Randau et al. No. 1 Parker, is in the NEc NW of 4-23-16W, southeast of Heman, and near the line between Major and Woodward county. It was reported to have had a small amount of oil in the hole which was nearly full of water, at 652 feet. Geologists state the Red Beds in this vicinity are from 2000 to 2300 feet thick, and that it is unlikely that any oil will be found in this formation. It is reported the well is being guarded to keep visitors away, a fact which immediately diminishes the importance of the showing in the eyes of oil companies.

Seminole Developments

AT the end of the week the Seminole field was producing 118,264 barrels from 77 wells, this being within 2000 barrels of its peak, which was reached just before the shut down and proration agreement. Of this output, the 45 Wilcox sand wells were producing 105,637 barrels and the 32 wells in the Hunton lime contributed 12,627 barrels. Several of the Hunton lime wells are being drilled to the Wilcox, but are producing from the upper formation in the meantime.

Several wells were drilled into both the Hunton and the Wilcox sand during the week, with varying results, but it is noticeable that new completions are coming in for much smaller initial production than those drilled in a month ago. This is to be expected with the lowering of the field's gas pressure, which was low in its best days. How-

Osage Drilling Limit Extended 90 Days

TULSA, Dec. 4.—Notice was given Dec. 1 of a 90-day extension of time when drilling is required on Osage reservation leases by the Department of the Interior. The Osage Lessees Oil & Gas Association recently petitioned the secretary of the interior, through the Osage reservation agency, for an extension of six months or one year. Notice was also given that a hearing will be held in Washington probably in January to determine whether the request of the association should be met in full.

Drilling Operations in Okla., Kan., N. Texas and N. Mexico

	Dec. 4 — Week Ending					Nov. 27				
OKLAHOMA	Loc.	Rigs	Drg.	S.D.	Total	Loc.	Rigs	Drg.	S.D.	Total
Burbank	5	12	38	...	55	6	11	39	...	56
Other Osage	13	8	62	4	87	9	13	61	2	85
Bristow-Cushing	14	16	117	16	163	12	17	118	11	158
North Oklahoma	13	22	107	40	182	10	24	118	52	204
South Oklahoma	33	32	177	40	282	20	29	169	41	259
Muskogee	..	12	55	15	82	...	14	54	11	79
Okmulgee-Bristow	1	53	154	25	233	1	45	145	29	220
Tonkawa	1	...	10	3	14	1	...	9	2	12
Seminole Dist.	25	54	331	23	433	33	50	306	28	417
Total Oklahoma	105	209	1051	166	1531	92	203	1019	176	1490
KANSAS	61	79	223	103	466	64	68	234	96	462
TEXAS										
Central Tex.	..	89	224	113	426	...	74	775	96	445
East Texas	..	2	19	15	36	...	2	19	15	36
Panhandle	..	144	331	89	564	...	153	353	92	598
N. Central Tex.	..	76	137	53	266	...	88	133	35	256
W. Texas	..	99	198	51	348	...	99	172	39	310
Total Texas	...	410	909	321	1640	...	416	952	277	1645
GRAND TOTAL	166	698	2121	590	3637	156	687	2205	549	3597
NEW MEXICO	8	1	33	28	70	9	4	28	29	70

Completions in Oklahoma and Kansas, Week Ending Dec. 4

Carter County

Company	Well No.	Location Survey	Depth	Initial Prod.
Smith	1	NEc NW SW 22-2-3W	T.D.2313	Dry

Caddo County

Company	Well No.	Location Survey	Depth	Initial Prod.
Magnolia	4	SWc NW NW 11-5-5W	2180–2400	50

Creek County

Company	Well No.	Location Survey	Depth	Initial Prod.
Burnett et al	1	SEc NW 1-18-7E	2858–2845 OWD	10
Silurian	28	NWc SW SW 8-18-7	2390–2425	30
Devonian	1	CWL NE SE 4-18-12	2219–2251	2M
Roxana	4	NEc SW NE 10-17-9E	2032–2056	80
Sheridan	1	NWc 27-18-11	2285–2293	10M
Wilcox	3	NW SE NE 10-17-9	2022–2052	75
Arnold et al	1	SWc SE NW 2-17-10	1993–2045	25
Dixie	1	SEc SW SW 5-17-10	2993–3036	385
Wisener et al	5	NWc 16-17-11	1105–1126	18M
Sheery et al	1	SW SE NE 5-18-10	T.D.2884	Dry
White Eagle et al	1	SWc NW 31-18-10	T.D.3158	Dry

Garfield County—Garber

Company	Well No.	Location Survey	Depth	Initial Prod.
Sinclair	27	CSL N½ SW 13-22-4W	1126–1135	58
Sinclair	9	NEc SE 36-22-4	2198–2210	5
Sinclair	52	C SW NW 18-22-3	3620–3650	300
Sinclair	13	NEc NW 19-22-3	2115–2128 OWD	65
Mid-Cont. et al	70	NE SE SE 13-22-4	T.D.3405 OWD	Dry

Grant County

Company	Well No.	Location Survey	Depth	Initial Prod.
West. States	1	SWc 14-27-3W	4068–4112 OWD	22M

Hughes County

Company	Well No.	Location Survey	Depth	Initial Prod.
Indep	4	SWc SE 26-9-9E	T.D.3326	75
Dixie	9	NWc NE 5-7-8E	4176–4193	1100
Indep. et al	1	SWc NW 26-9-9E	T.D.3490	Dry
Sory et al	1	SEc NW SW 4-8-11	T.D.3475	Dry

Jefferson County

Company	Well No.	Location Survey	Depth	Initial Prod.
Gypsy	1	SEc SW NE 33-6-5W	1512–1518	35
Gypsy	33	CSL SE NE 33-6-5	T.D.1600	Dry

Kay County

Company	Well No.	Location Survey	Depth	Initial Prod.
Marland	2	NWc NE SE 17-29-1E	2313–2447	150
Carter et al	2	NEc NW NE 20-29-1E	T.D.3382	65
Comar	1	NEc SE SW SW 5-28-1W	T.D.2404	Dry
Marland et al	1	SWc SE SW 6-26-1W	T.D.1261	Dry

Kingfisher County

Company	Well No.	Location Survey	Depth	Initial Prod.
Marland	1	SWc NW 12-18-5W	T.D.4502	Dry

Lincoln County

Company	Well No.	Location Survey	Depth	Initial Prod.
Texas	1	SWc NW 22-14-5	3930–3950	75

Muskogee County

Company	Well No.	Location Survey	Depth	Initial Prod.
Bradley	3	NEc NW SW 5-14-19	T.D. 750	Dry

Nowata County

Company	Well No.	Location Survey	Depth	Initial Prod.
Prairie	31	NEc SW NW 31-25-17E	497– 518	10

Okfuskee County

Company	Well No.	Location Survey	Depth	Initial Prod.
Josey	1	SW SE SW 28-12-11	3628–3635	40

Oklahoma County

Company	Well No.	Location Survey	Depth	Initial Prod.
Maxine	1	SWc 9-13-1W	T.D.4110	Dry

Okmulgee County

Company	Well No.	Location Survey	Depth	Initial Prod.
Campbell et al	1	NEc SW SE 3-15-11E	2085–2094	12M
Pine	1	NEc SW NE 4-14-12	2681–2699	5M
Hewitt	10	C SE NW 33-14-14	1107–1120	30
Elm	8	SEc NE NW 28-13-14E	1895–1945	35
Riverland	1	NWc NE NE 19-16-13	T.D.2780	Dry
King	1	SEc NW 11-11-13	T.D.2450	Dry

Osage County—Burbank

Company	Well No.	Location Survey	Depth	Initial Prod.
Phillips	4	SEc 20-26-6E	2992–2996	470

Osage County

Company	Well No.	Location Survey	Depth	Initial Prod.
Texas	6	SEc NE 30-25-8E	2480–2505	200
Texas	7	NEc SW NE 30-25-8	2450–2505	312
Mason-Carter	8	NE NW NE 23-21-8	2223–2252	200

Pawnee County

Company	Well No.	Location Survey	Depth	Initial Prod.
Minnehoma	10	CNL NW NW 24-21-7	2708–2712	1700
Marland et al	1	33-20-5	T.D.3696	20

Payne County

Company	Well No.	Location Survey	Depth	Initial Prod.
Magnolia	1	SEc NW SW 8-19-5	3034–3041	15
Empire	5	NEc SW NW 26-18-3E	4302–4324	110

Pontotoc County

Company	Well No.	Location Survey	Depth	Initial Prod.
Tidal	1	NE NW SE 28-5-5E	T.D.2917	Dry

Seminole County

Company	Well No.	Location Survey	Depth	Initial Prod.
Mid-Cont	1	NE SE SW 24-9-6E	4129–4143 OWD	5304
Pure	3	SEc NE SW 26-9-6E	4057–4153	3135
Gypsy	1	SWc SE SE 11-10-8	T.D.3524	Dry
Tidal	2	SEc SE 23-10-8	T.D.4232	Dry
Plover	1	SWc SE 8-9-8E	T.D.3668	Dry
Prairie	1	NEc NW NW 25-9-6	3975–3993	100

Stephens County

Company	Well No.	Location Survey	Depth	Initial Prod.
Magnolia	11	SEc SW NE 25-1-9W	T.D.2755	Dry
Lone Star et al	7	NEc NW SE NE 30-1-8W	T.D.2587 OWD	Dry
Magnolia	2	NWc NE NW 3-2-5W	T.D.3610	Dry
Magnolia	4	SEc NE SE 11-5-9W	1958–1970	50
Pearce-Brown	1	SWc SE 27-1-8W	1620–1668	1M
Malernee et al	1	NWc NE NE 34-1-8W	1395–1408	8M

Tulsa County

Company	Well No.	Location Survey	Depth	Initial Prod.
Mishall et al	3	NEc NW SE SW 15-19-11	2132–2148	60
Gordon et al	1	SWc NE 16-19-10E	T.D.2050	Dry
Mid-Kans	1	SEc SW SE 24-19-10	T.D.2654	Dry
Commercial	1	NWc SE 19-19-11	T.D.2442	Dry
Atlantic et al	1	CEL NW NW 16-19-12	T.D.2257	Dry
Atkins et al	1	NEc SE 35-19-13	T.D.2180	Dry

Wagoner County

Company	Well No.	Location Survey	Depth	Initial Prod.
Carder	2	C E½ SE 31-18-15E	T.D.1205	Dry
Newman	1	CEL NE SE 13-17-16	1117–1153	6M

KANSAS

Butler County

Company	Well No.	Location Survey	Depth	Initial Prod.
Rodgers et al	1	NEc 31-26-8E	2680–2716	40
Johnson et al	6	SEc NW SW 5-28-6E	2771–2774	250
Connell et al	1	NWc NE 1-25-5E	T.D.3067	Dry
White Eagle et al	5	SEc NE SW 12-27-7E	T.D.2768	Dry
Johnson et al	3	NEc NW SW 3-28-6E	T.D.3098	Dry

Greenwood County

Company	Well No.	Location Survey	Depth	Initial Prod.
Phillips	1	SWc NE 29-22-11	T.D.2200	Dry
Fisher et al	1	NEc SE NE 12-23-11	T.D.2175	Dry
Orlando et al	1	NWc NE 6-23-11	T.D.2148	Dry
York State	1	SEc SW SW 36-23-11	T.D.1938	Dry
Derby	1	NWc SE 25-25-9	T.D.2189	Dry
Davis et al	10	SWc SE SW 7-22-11	2100–2117	25
Empire	8	NEc SW 14-22-11	1895–1919	90
Mid-Cont	12	NWc NE SW 18-22-11	2090–2109	36
Skelly	17	SWc NW NW 27-22-11	1955–1968	60
Texas	2	CNL NW SE NE 9-22-12	1616–1662	75
Fisher et al	1	NEc SW 7-23-11	2029–2046	30
Texas	4	SWc NW 16-23-11	1925–1978	150
Texas	5	NEc NW NW 16-23-11	1949–2017	15
Manhattan et al	5	NEc 19-24-11	1976–1820	75

Marion County

Company	Well No.	Location Survey	Depth	Initial Prod.
Burford et al	1	NWc NE 8-22-5E	T.D.2731	Dry
Connell	2	NWc SE NE 19-21-5	T.D.2561	Dry

Rice County

Company	Well No.	Location Survey	Depth	Initial Prod.
Prairie	2	SEc 34-20-6E	3363–3462	150

ever, a large number of wells are due to reach the sand in a short time, and it is possible their combined production, even though smaller initially than earlier wells, may boost the field's output to a much higher figure than it has yet attained.

The best well of the week at Seminole was Barnsdall Oil Co. No. 4 Carter, in the NWc SE NW of 24-9-6. At last reports, this well was drilling at 4140 feet in the Wilcox sand, and flowed 3850 barrels in 24 hours. Gypsy Oil Co. did not have as good luck in its No. 3 Carter, in the NWc of 24, as it failed to find production in the Wilcox and was plugged back to the Hunton lime, where it is producing 600 barrels daily.

Depth Increases Flow

THE second well to be completed in section 23, where the Amerada's No. 1 Killingsworth has been the only producer for nearly three months, was the Carter Oil Co. No. 3 Joe Carter, in the SEc NE SE of the section. This well topped the Hunton lime at 3865, was drilling at 3898 feet at last reports and was flowing about 120 barrels an hour. It showed for only a small well in the upper part of the Hunton but increased its production with deepening. Amerada's No. 1 Rentie, in this section, located in the SEc NW NE, had the Hunton lime at 3905 feet and at last reports had a hole full of oil

Carter Oil Co. drilled its No. 1 Fixico, in the NWcSE of 23-9-6, down to the Wilcox after failing to find production in the Hunton, getting the deep pay from 4107 to 4118 feet, and the well is making 2500 barrels daily. Mid-Continent Petroleum Corp. No. 2 Rentie, in the SEc SW SE of 14-9-6, which is in line with the farthest north production in the field, topped the Hunton lime at 3932 feet and at six feet in was flowing 25 barrels an hour.

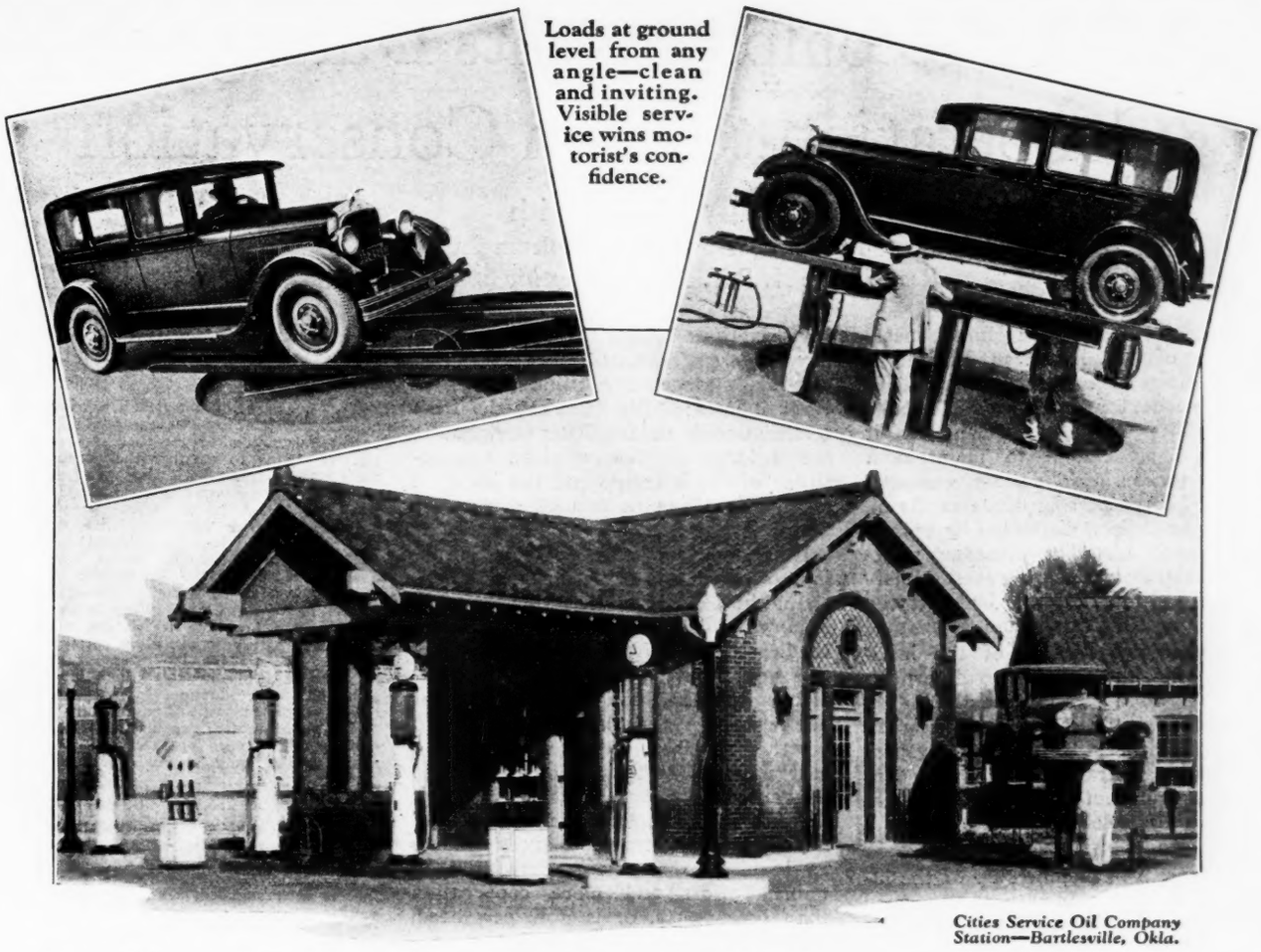
In the Searight pool, four miles northwest of Seminole production, Prairie Oil & Gas Co. had the Wilcox sand at 4337 feet in its No. 4 Kinkade, in the SWc SE SE of 33-10-6. It had its first oil four feet lower, and at 4342 feet depth was flowing 40 barrels an hour. It is being drilled deeper, and probably will show much large production. Northeast of this well about three-quarters mile, the same company apparently has a dry hole in its No. 1 Stewart, in the SWc NW of 34-10-6. This well has a hole full of water at 4410 feet, according to reports. It had the Wilcox at 4405 feet with a showing of oil but drilled into water at 4408 feet. Another Searight pool well was the Mid-Continent Petroleum Corp. No. 3 Grayson, in the NEc SW SW of 34-10-6. This well had the Hunton lime at 4045, with first oil at 4116 and is making 20 barrels an hour. At last reports it was drilling ahead at 4160 feet.

Completions in N. C. & E. Texas & Panhandle, Week Ending Dec. 4

Company	Well	Location Survey	Depth	Initial Prod.
Archer County				
Beller et al	9-Welmet	SP	1391–1400	8
Woods et al	1-Wilson	TMG	1602–1608	8
Simms	13-Turberville	Carson	1505–1535	
Barnsdall	1-Wolfe	Miles	1363–1373	7
Camp-Muse	1-Wilson	ATNC	T.D.1495	Dry
Burleson et al	1-Prescher	C&P	T.D.1655	Dry
Murchison-Fain	1-Parkey	Dallas	T.D.1504	Dry
Continental	1-Abercrombie		T.D.1384	Dry
Golding et al	1-Crawford	Crawford	T.D.1238	Dry
Texas	1-Bearden	McLyman	T.D.1220	Dry
Brown County				
Kone	9-Foster	Benson	1185–1210	50
Humble	9-Hodnot	Harris	1194–1220	200
Tidal	3-Hodlott	Harris	1156–1205	380
Danciger et al	1-Haynes	Delgado	1167–1186	280
Humble	8-Armstrong	Delgado	1181–1199	535
Pandem	7-Westerman	Mitchell	1244–1270	200
Humble	6-Wooldridge	ET	1145–1165	100
Williamson et al	3-Wooldridge	ET	1223–1233	150
Texas	8-Eddington	Mitchell	1280–1283	10
Hill-West	21-Newton	Mitchell	1215–1234	3
Mid-West	4-Suttles	Mitchell	1131–1143	7
Mid-West	17-Suttles	Mitchell	1154–1156	25
Amerada	4-Fry	Stubblefield	1302–1317	300
Amerada	5-Fry	Stubblefield	1298–1308	504
Amerada	7-Fry	Stubblefield	1304–1309	400
Choate et al	2-Lowe	Stubblefield	1312–1318	50
Choate et al	4-Lowe	Stubblefield	1290–1308	80
Gibson	2-Shore	Rhyne	1208–1230	30
Humble	5-Fry	Chandoin	1322–1328	120
Magnolia	5-Fry	Chandoin	1309–1319	90
Moore	1-Brison	Day	1324–1345	80
Price et al	1-Andrews	Bannister	1313–1324	120
Callahan County				
Brown	4-Long	Anderson	1395–1411	10
Slick	4-McDonough	Edwards	1388–1404	10
Pandem et al	1-Roching		T.D.1405	Dry
Carson County—Panhandle				
Gulf	20-Burnett	I&GN	3145–3176	400
White Deer	1-Brown	I&GN	3130–3140	12M
Roxana	1-Bryan	I&GN	3172–3204	460
Crane County				
Gulf	1-Lassiter	Univ.	1165–3051	142
Marland	1-Cosden	GCSD	2325–	190
Texas	10-King	GCSD	2306–2369	180
Indep	3-Taylor	Sapp	2030–2042	315
Crockett County				
Hughes	3-Powell	BB	2678–2689	250
Hughes	2-Powell	EL	2645–2670	185
Eastland County				
Panhandle	22-Hightower	Van Norman	1212–1226	20
Teatsorth et al	1-Johnson	H&TC	1790–1802	7M
Lewis et al	1-Connellee	Ussery	1223–1244	5
Arab	1-Beard	H&TC	T.D.1853	Dry
Gulf	1-Allen	Robertson	T.D.2016	Dry
Humble	1-Dill	ET	T.D.3175	Dry
Falls County				
Forbes et al	1-Kyser	Sessan	T.D.2508	Dry
Gray County				
Prairie et al	4-Reynolds	I&GN	3017–3064	242
Sun	2-Reynolds	I&GN	3019–3179	65
Texas	1-Saunders	I&GN	T.D.4096	Dry
Hutchinson County				
Sunrise	1-Lyall	EL	2700–2763	10
Wentz	1-Reimer	T & R	2886–2992	10M
Gulf et al	31-Dial	Bk 47	2710–2785	275
Phillips	1-George	H&TC	2897–2939	210
Mid-West	1-Johnson	H&TC	2660–2670	125
Phillips	1-Neal	H&TC	2694–2753	75
Gulf	4-Whittenburg	H&TC	2620–2770	70
Skelly	4-Whittenburg	H&TC	2891–2911	100
Phillips	1-Whittenburg	H&TC	2700–2757	50
Brookins et al	1-Whittenburg	M&C	2734–2760	250
Derby	4-Johnson	M&C	2901–2951	1407
Gulf	3-Whittenburg	Whitley	2915–2935	900
Gulf	8-Whittenburg	Whitley	2938–2967	265
Phillips	7-Whittenburg	Tomlinson	2860–2928	500
Skelly	12-Johnson	M&C	2925–2985	580
Devonian	4-Whittenburg	Whitley	2895–2928	312
Dixon Creek	25-Smith	M&C	2762–2788	63
Mid-West	1-Dick	M&C	2530–2650	7M
Skelly	4-Cunningham	D&SE	2924–2960	35
Skelly	1-Prichard	D&SE	2727–2760	140
Triangle	1-Smith	M&C	2761–2799	650
Dixon Creek	16-Smith	M&C	2910–2982	50
Dixon Creek	17-Smith	M&C	2995–3000	125
Empire	9-Weatherly	M&C	3025–3043	140
Marland	1-Wright	M&C	2900–2970	10
Marland	3-Weatherly	M&C	2990–3042	100
McIlroy	7-Smith	M&C	2857–2971	65
Summit	1-Whittenburg	M&C	2932–2989	250
Dixon Creek	2-Smith	M&C	2863–2867	1500
Jack County				
Buttram	4-Preston	Chairs	2181–2087	130
Jones County				
Wentz	1-Blanton	Berryhill	T.D.2505	Dry
Limestone County				
Pure	1-Cogdell	Varella	2575–2840	110
Transcontinental	16-Rosson	Varella	2610–2804	630
Cayton et al	1-Thornton	Boyd	T.D.3090	Dry
Mitchell County				
California	6-Womack	TP	T.D.3068	38
Magnolia	2-Adams	TP	2912–3038	65
Montague County				
Texas	3-Martin	Votan	1168–1172	55
Texhoma	3-Rowland	Votan	1055–1126	90
Cato	6-Rolls	Chambliss	834– 852	165
Farlyn	6-Maddox	Thompson	893– 908	60
Farlyn	1-Maddox	Thompson	884– 894	30
Humble	1-Maddox	Thompson	888– 903	400
Humble	4-Maddox	Thompson	T.D. 900	50
Kahle-Grasey	1-	Chambliss	843– 897	15
Olean	6-Maddox	Chambliss	866– 886	60
Olean	10-Maddox	Chambliss	838– 855	75
Texas	3-Maddox	Chambliss	872– 879	83
Texhoma	3-Howard	Chambliss	1355–1370	25
Texhoma et al	6-Howard	Thompson	864– 891	55
Texhoma	19-Rowland	Chambliss	1066–1087	112
Texhoma	20-Rowland	Chambliss	1074–1080	35
Fleming et al	2-Howard	Chambliss	1127–1157	35
Texhoma	5-Salmon	Zuber	881– 895	21
Humble	10-Hynd	Wall	901– 912	21
Humphreys	3-Howard	Chamblias	1360–1371	44
Navarro County				
Stanley et al	10-Cox	Shire	T.D.2780	Dry
Potter County				
Gulf	1-Bush	BS&F	3895–4020	Dry
Shackelford County				
Hyde et al	3-Moberly	ET	1137–1154	150
Rosier-Pendleton	5-Cook	ET	1245–1265	400
Rosier-Pendleton	9-Cook	ET	1226–1400	1400
Rosier-Pendleton	12-Cook	ET	1229–1239	700
Rosier-Pendleton	14-Cook	ET	1245–1256	200
Rosier-Pendleton	1-Cook	ET	1131–1149	500
Rosier-Pendleton	2-Cook	ET	1144–1159	40
Hope	3-Davis	WY&RA	1444–1449	20
Empire	1-Poindexter	Bok 11	990– 996	10
Skelly	2-Mathews	TE&L	T.D.1460	Dry
Gibson et al	1-Akers	TP	T.D.2005	Dry
Chronic	2-Goodwin	TP	T.D.1801	Dry
Stephens County				
Lyman et al	2-Langton	TP	2145–2148	60, 2½M
Throckmorton County				
Bryant et al	1-Llano	Fannin	T.D.2980	Dry
Upton County				
Gulf	1-Sanger	MK&T	T.D.3682	Dry
Texas	5-King	GCSD	2024–2167	640
Indep	10-Taylor	Sapp	2080–2210	60
Roxana	2-Estep	MK&T	2336–2375	75
Roxana	3-Estep	MK&T	2365–2363	80
Tex-Pac	3-Shirk	MK&T	2180–2210	90
Young County				
Panhandle	1-Self	Rolings	T.D. 815	Dry
Gwinnup et al	1-Jones	TEL	T.D.1550	Dry
Roamer	1-Meeley	TEL	T.D.1163	Dry

Completions in North Louisiana and Arkansas, Week Ending Dec. 2

Company	Well	Location	Depth	Yield
LOUISIANA				
Urania				
O. W. Clark, trustee	Miles No. 3	25-10-1E	1540	40
Little Creek				
H. L. Hunt	Mathews Estate No. 1	15- 9-1E	1750	s.w. aband.
Montague Oil Co	Zenoria Lbr. Co. No.4	11- 9-1E	1505	100
Geo. W. Weatherbee	Urania A-6	2- 9-1E	1500	500
Caddo Parish—Vivian				
Bayou State Oil Co	Peak No. 25	23-22-15	1020	30
Bussa et al	Allen No. 8	23-22-15	1070	25
Caddo Parish—Caddo District				
Golden Flood Oil Co	Atkins No. 2	31-21-15	1699	15
Superior Oil Co	Youree No. 4	26-20-15	2290	70
Caddo Parish—Belcher				
Ohio Oil Co	E. K. Smith No. 28	7-21-14	1600	80
DeSoto Parish—Naborton				
Texas Oil Co	Wemple A-11	2-12-12	2440	75
Grant Parish—Dalton District				
Tunica Pet. Co	L. & A. No. 10	8- 8-1W	2060	dry aband.
Ouachita Parish				
New Process Carbon Black Co	Cole No. 8	35-20-4E	2190	5m. ft. gas
United Carbon Co	White No. 1	32-21-4E	2190	20m. ft. gas
EAST TEXAS				
Waskom				
J. R. Bahan	C. M. Abney No.3 J.J.Blair HRS		1940	25m. ft. gas
ARKANSAS				
Nevada County				
Humble O. & R. Co	Graves C-2	1-14-21	1140	200
Columbia County—Waldo				
Gulf Refining Co	Huggins No. 1	31-17-22	2910	dry aband.
Smackover				
Ohio Oil Co	Cramer No. 20	27-15-16	2050	25
Sun Company	Hardin No. 7	27-15-16	2265	20
Woodley Pet. Co	Berg No. 3	32-15-15	2010	60
Lion O. & R. Co	Bilyew C-6	8-16-15	2785	30m. ft. gas
Stewart et al	Murphy No. 1	9-16-15	2738	20m. ft. gas
Lisbon				
Lion O. & R. Co	Werner No. 4	21-17-16	2202	35



Loads at ground level from any angle—clean and inviting. Visible service wins motorist's confidence.

Cities Service Oil Company Station—Bartlesville, Okla.

Sells More Oil — More Grease — More Gasoline

"THE rendering of Rotary Lift Service has not only resulted in a direct profit, but has also increased the sales of Cities Service gasoline and oil by attracting patrons. Grease sales have steadily mounted, and show the remarkable increase of 600%. With this service, more cars can be thoroughly greased in a day than in two days with the greasing pit, and the dispatch of this service is a wonderful asset to the station."

CITIES SERVICE OIL COMPANY.

Some of the Leading Oil Companies Providing Rotary Lift Service

Associated Oil Co.
Atlantic Refining Co.
Barnsdall Refining Co.
California Petr. Corp.
Champlin Refining Co.
Cities Service Oil Co.
Continental Oil Co.
Crew Levick Co.
Galena Signal Oil Co.
Gulf Refining Co.
Imperial Oil, Limited
Indian Refining Co.

Rotary Lift TRADE MARK

Magnolia Petroleum Co.
Manhattan Oil Co.
Pan-American Petr. Corp.
Richfield Oil Co.
Shaffer Oil & Refg. Co.
Shell Co. of California
Sinclair Refining Co.
Standard Oil Co. of Ky.
Standard Oil Co. of N.J.
Standard Oil Co. of Ohio
Texas Company
Tidewater Oil Co.

Complete Lubrication Service on Rotary Lift is a Money-Maker, Winter and Summer. Increases sales immediately — attracts and holds trade.

WRITE FOR THE PLAN TODAY!

AUTOMOBILE ROTARY LIFT COMPANY, 307 No. Michigan Ave., Chicago, Illinois

Divisional Sales Offices: New York — San Francisco :: :: :: Canadian Distributors: Imperial Oil, Limited, Toronto

A.P.I. Accomplishments During 1926; Cooperation to Gain Conservation

By W. S. Farish
President, American Petroleum Institute
Read Before A. P. I. Annual Meeting at Tulsa, Dec. 7

THIS is the seventh annual meeting of the American Petroleum Institute, which was organized in 1919. The doubts which existed at the time of its organization whether it would be practicable to maintain a national forum in so diverse, competitive and far-spread a business as the oil industry have been dissipated by events. Each year in turn has witnessed progress. I attribute this progress primarily to the gradual recognition that the Institute is, in fact, a forum.

The executive officers of the institute are not the persons to determine what the action of the drama shall be. The executive officers turn on the lights, shift the scenery, distribute the programs and generally make themselves useful carrying out your desires. There is no other sound foundation for a national trade organization.

The growth in membership of the institute has been the natural expansion incident to increased activities of the industry itself in using its common forum. In the last year 420 new members, representing an increase of 14 percent over the previous year, have been added. Memberships are individual; cost but $10 a year. Every oil man ought to be a member.

The work of the institute cannot be financed from $10 memberships. Its principal support must come from voluntary contributions made with some relationship to the size and earnings of companies engaged in the business. The executive committee has worked out as equitable a plan as possible, and it is gratifying to tell you that so far this year 291 subscriptions—some small, some large—have been received, the number of subscribers having increased 45 percent over 1925. The financial condition of the institute is sound, because, in my judgment, the activities in which it engages are sound.

Conservation

THE industry, as a whole, is interested in the policies and action of the national government. Three major inquiries emanating from that government have been of universal interest to oil men. The Federal Oil Conservation Board, appointed by the President, has been engaged in an inquiry relative to conservation. The Department of Justice and the Federal Trade Commission each have been seeking to ascertain whether unlawful restraint of trade exists. To all of these government agencies the institute has offered its good offices and given its assistance. Investigations by the last two agencies have been so frequent as to remind one of the statement attributed to an English Lord: "We have had the Irish question with us for 700 years, but it seems longer!" Nevertheless, the attitude of the industry and the institute rightly has been to furnish every fact pertaining to the economic situation.

It is a curious fact—and this is said in no spirit of criticism—that there should be pending at the same time one inquiry and two investigations proceeding from different departments of the government; one asking in substance whether there is not a waste of oil because of its cheapness, and two whether there is not a waste of the consumer's dollar because of high prices. However anomalous the situation may be, there is considerable comfort in having one government agency make an inquiry to ascertain whether more unified effort and more cooperation than now exists, or is now permitted, would not be in the national interest—even if contemporaneously we must convince two departments of the government that such as there is, falls within lawful limits. The Irish question seems no longer to be with England because it was settled right. There is no fact or circumstance, no condition or influence pertaining to oil which cannot be settled right—and to this end it behooves us all to lend our assistance.

Federal Board's Report

SINCE our last meeting the Federal Oil Conservation on Board issued a preliminary report, showing on its face the most careful consideration of the problem of conservation, and a commendable disposition to make recommended changes mesh with the hard facts of the situation. It is a striking characteristic of the report that no recommendation is made which can be dismissed simply because it represents an ideal or a theory, falling of its own weight because of its impracticable nature. It is not a document which can, or will be laid aside in government archives to gather dust.

The key to the attitude of the board is found on page 13 of the printed copy of the report:

> The major part of the measures that must be taken to protect our future supplies must rest upon the normal commercial initiative of private enterprise. The field for governmental action is considerable, but to formulate the broader by-laws of the industry in the sense of conservation and to concentrate thought upon them, is the major part of the boards task in cooperation with the industry.

Throughout the report runs the thread that cooperation between producers in separate pools or fields should be permitted. On pages 16 the report states:

> The question of the legality of cooperative agreements has been frequently raised in the recent discussion of remedial measures. The uncertainty as to whether the economic betterment through substituting cooperation for competition runs counter to Federal and State laws has served as an actual or imagined or pretended barrier to cooperative action, and the removal of that legal inhibition is asked, although the suggestion comes from the industry that 'to protect the public, approval of such agreements by some commission or Board should be required.' This doubt should be removed by appropriate legislation.
>
> The voluntary cooperation proposed would need to include the landowners and operators in a single field or pool, which is a relatively small unit of production, so that the possibility of monopolistic control need not be feared. Indeed, cooperative regulation of either the development or the operation of a single pool could control only a small percentage of the country's production.

The recommendations of the board are epitomized in this sentence from the last paragraph of the report:

> The complete organization of cooperative effort is recommended, with simple but effective working units that will insure full contact of the industry with both State and Federal Governments and continuous contact between all operators in an oil field.

Since the issuance of the report, Secretary Hoover was quoted as follows:

> You have the annual meeting of the American Petroleum Institute coming to your city in December, and if members of this body can get together and formulate some plan regarding modification of the Sherman anti-trust act, as applied to drilling flush fields, and properly present this plan, I see no reason why it should not receive favorable action at the hands of Congress.
>
> When the Federal Oil Conservation Board was formed, there was a suspicion in the minds of the oil men that it was created to harass and worry the oil business. That absolutely was not the intention. The Federal Oil Conservation Board was formed for the purpose of assisting the industry, and helping it to work out whatever problems confronted it.
>
> In doing this work, it has already made a start, and other steps will follow. In assisting the Federal Oil Conservation Board, the industry can do much, and most of the remedies which will be helpful to the petroleum situation should originate within the industry itself.

Thus, it has been put squarely up to the petroleum industry as a whole to state whether, in the interests of economy, some form of cooperation having for its objective the maximum production of oil at the lowest practicable cost, and some control of production not now attainable, is desirable; and if so, to recommend for the consideration of the appropriate authorities what measures are practicable and meet with general approval.

Responsibility on Industry

THUS, a great responsibility has been placed upon the industry. The problem rests upon the shoulders of every person, both as a member of the industry and as a citizen. The board of

directors of the institute seeks the advice of all who will give it. It goes without saying that the board will give the most careful consideration to the problem. Any action to be recommended must rest upon sound premises, and must give proper protection to the industry and to the public.

The board has this problem to consider and would like to have the benefit of the ideas of every member on it. Will you not, therefore, any of you who have definite ideas on this subject, give them to some member of the board at this meeting?

It is not the function of the president of the institute to attempt to anticipate the action of the board of directors on important questions of policy and action. Some suggestions have occurred to me, and they are offered only to elicit criticisms, and to encourage others to offer suggestions.

There is no one, I believe, who would seek either from Congress or from the states any form of legislation which would result in restraint of trade, using that term in the ordinary sense, meaning specifically as to oil, the control of production for the purpose of controlling price. Such legislation would be contrary to the spirit of our institutions. Competition is necessary, not merely as a protection to the consumer, but also to the development of the industry. Cooperation must stop somewhere short of this properly forbidden territory.

There are two avenues of approach to proper cooperation, the object of which is true economy; one is to attempt to set up at once a comprehensive and far-reaching plan covering the whole subject, and the other is to start in the direction of economy by attacking the problem in its simplest terms. My suggestion, put forward for criticism, pursues the latter avenue.

Oil Pool is Starting Point

AN oil pool, or an oil field, is the starting point of production. It is our smallest and simplest unit. The owners of an oil pool have individual interests, and they have some interests in common. A rational plan to permit them to safeguard their common interests by cooperation involves merely the removal of a threat of prosecution, rather than an exemption but for which the prosecution would result in conviction. It is all very well to say that this amounts to asking the authorities to lower an unloaded gun. As a practical matter, the world is full of people to whom the pulling of a trigger on an unloaded gun pointed straight at them still causes discomfort.

The possibility that a gun will be pointed at persons developing a single pool or field should be removed from our law. Oil producers should not have to turn to experts in legal armament every time they attempt to cooperate with a neighboring owner of a common pool. They should be able to concentrate their energies upon a business-like and scientific development of the pool.

Now if the legislative authorities cannot be convinced of the soundness of these simple proposals, it would seem to be a fruitless undertaking to ask them to go further. So far as the federal government is concerned, therefore, the question is whether Congress would be willing to state plainly that agreements between producers of oil in single pools and fields not in violation of state anti-trust acts are not within the scope of the federal anti-trust laws. The net effect of such a clarification of the law would be to permit producers to cooperate to the fullest extent possible with the state boards and commissions charged with the duty of enforcing not merely penal statutes but conservation as well.

Producers would still be liable under the provisions of the state anti-trust acts, but the states are also vitally interested in economy. The federal government has only prosecuting attorneys on the ground, whereas the states have not only prosecuting attorneys but also conservation officers. The producer must deal with both. People on the ground, familiar with every operation, and cooperating in most instances, can discern whether an agreement seeks restraint, or conservation.

Publications

THE statistical publications of the institute have attained a greater degree of perfection, and should have become increasingly valuable to the membership, as the Institute has been able to get the help and cooperation of a greater number within the industry. These reports now represent 81 per cent of the total refining industry and 100 per cent of the producing industry.

Technical Activities

The technical activities of the Institute have been growing in importance and are covering an ever widening field:

Fire Prevention

During the past year, the institute's general committee on fire prevention has studied two good-practice statements being prepared by the National Fire Prevention Association, and has made recommendations regarding them. One of these statements deals with the location, construction and operation of marine oil terminals and the other with the construction and operation of gasoline tank trucks. This cooperation is effected through representation on the Flammable Liquids Committee of the N. F. P. A.

Perhaps the most important result of cooperation with the N. F. P. A. up to the present, is the modification of the table of distances between oil storage tanks and property line contained in the N. F. P. A. "Suggested Ordinance Regulating the Use, Handling, Storage and Sale of Flammable Liquids." The tank fire record compiled during 1925 showed that a radical reduction in the previous distance table was justified, and the effort of years culminated in a favorable revision of the suggested ordinance at the annual convention of the N. F. P. A. in May, 1926.

The compilation of the current fire loss record of the petroleum industry is one of the activities of the fire prevention committee. Periodic analysis of this record, providing the record is complete, will undoubtedly be of real benefit to our industry in reducing our loss through fire and in combating ill advised and unwarranted legislation with regard to the handling and storing of our products. Presumably, most of the oil companies represented in this audience are furnishing the Institute with confidential records of their fires as they occur, or at stated intervals, and it is my hope that this may soon be the general practice of the industry, from the large producer or refiner to the small retail marketer. For the information of those who may not have heard of this development, may I say that a standard fire report form has been prepared by the institute's committee and copies will be furnished as needed.

The committee is also studying vents, screens, and flame arrestors for storage tanks and the problem of static electricity.

Motor Fuel Research

COOPERATIVE research on motor fuel problems at the Bureau of Standards has been continued during the past year, the cooperating organizations being the National Automobile Chamber of Commerce, the Society of Automotive Engineers, the Bureau of Standards, and the American Petroleum Institute.

Attention has been concentrated this year on the problems of motor starting and acceleration.

This activity has been supported for several years, and in addition to a report on the year's work, a summary of the results obtained from the beginning will be presented at one of the group sessions of this meeting.

Methods of Testing Products

THE institute has not undertaken the development and standardization of methods of testing petroleum products. Work of this character has been handled most satisfactorily over a period of years by committee D-2 on petroleum products and lubricants of the American Society for Testing Materials, and it has been a logical development for the institute to cooperate actively in the work of this committee.

While the institute has taken no steps up to the present time for recognizing the A. S. T. M. methods of testing petroleum products as standards of the American Petroleum Institute, they may be considered as having the complete endorsement of the large number of petroleum technologists represented on the committee.

A list of the methods of testing petroleum products and lubricants standardized by the A. S. T. M. may be se-

cured from the office of the Society in Philadelphia, or from the Institute.

Research

ON Nov. 15, 1925, John D. Rockefeller made available to the institute $50,000 in each of five years commencing with the year 1926 to initiate a program of scientific research in the geology, physics and chemistry of petroleum. This far-seeing action on the part of Mr. Rockefeller has met with universal commendation. The purpose of the gift was to start a movement for the ascertainment of basic scientific facts which do not lie within the realm of industrial or practical research. The field is vast and the ultimate results should be of great value to the industry.

The Universal Oil Products Co. at the last meeting of the institute made available $50,000 a year in each of five years commencing with the year 1926, so that now the institute has available $100,000 a year to carry on this important work.

For the purpose of suggesting projects, personnel, and assisting in the prosecution of the work, the advice of the National Research Council, Washington, an organization to coordinate and foster cooperative research, was sought and obtained. The National Research Council, through the Central Petroleum Committee, has recommended 31 projects in research, of which 17 have been approved, and 14 are being considered for action by appropriate committees of the institute. Work on the approved projects has been started.

Public Relations

THE year has marked the inauguration of work in public relations, which has long been looked forward to as one of the important activities ahead of us. It represents a phase of that cooperative effort which has been the aim of the institute from its beginning. A joint committee representing the institute and the trade organizations inside the industry, under the chairmanship of W. N. Davis, president, Mid-Continent Oil & Gas Association, was authorized to create an organization and determine the policies which should guide it. Arrangements were made for financing the work, and Judson C. Welliver was engaged to take direct charge of it.

Perhaps the aims of our public relations work cannot be better stated than in the words which Secretary Hoover used here in Tulsa a few days ago.

"The way to do business in America today," he said, "is to do it with glass pockets, and show the public what you really have, and what you really are doing. You may take the cases of several industries which have adopted this policy, and observe the very satisfactory results. I believe the oil industry is clean and has nothing to fear from a program such as these other industries have adopted."

That has been the aim and object of our public relations work; to let the public know the facts. We have believed that the welfare of the industry and the concern of the public alike require policies based on such knowledge. We have been confident that its wide dissemination would lead to adjustments and accommodations that would promote the common interest.

Discussion is Fair

THE moderation and fairness which has marked discussion during the year of subjects concerning the industry, notably those related to the activities of the Federal Oil Conservation Board, have fully justified this policy. The activities of the public relations work have been directed to establish a general understanding of the industry's problems, and a conception of its importance. The public relations service has sought to give publicity to the simple facts about the industry, and to place them in a proper relation to the social and industrial welfare of the community.

Ours is a peculiarly modern industry. Its developments has been almost without parallel for sweep and rapidity. Even the best informed among us are constantly amazed at contemplating the forces with which they are dealing and the magnitude of their responsibility. Certainly an industry of such proportions concerns the entire public. It is entitled to be known about, to be understood, to be appreciated. It asks for no more than an open mind and a square deal, and these we believe it is getting in more generous measure than ever before, thanks to the better public understanding of the complex problems it constantly faces.

It is our duty to ourselves, to the industry, to our hundreds of thousands of investors, to the public which we serve and which sustains us, to make sure that the facts shall be established in the minds of the community To that end has been directed the efforts of our public relations service. It has sought to fix in the public thought a realization of the large, dignified, significant and indispensable part which the industry plays in the country and the world. With some knowledge of the work that has been done in this department, and a good deal of confidence that it has been wisely directed toward better public understanding of the indusrty, I urge that these activities be supported, and that the fullest cooperation be extended those responsible for their prosecution.

Taxation and Accounting

THIS department consists of M. W. Mattison, domiciled in New York, and John F. McCormack, domiciled in Washington.

During the past year the taxation department has assisted in the handling of approximately 200 cases in Washington, principally in valuations of oil properties, and has been active in correspondence with various interests throughout the industry with reference to the technical features of the various Income Acts under which returns are now being administered in Washington.

Mr. McCormack gives assistance to anyone in the oil business who requests it of him in matters involving valuations of oil properties for depletion purposes. The present revenue act has simplified computations of depletion deductions greatly, but because of the fact that the Internal Revenue Bureau is still working on cases covering the years 1919 to 1923, inclusive, constant reviews are being made of previous valuations submitted, and, therefore the work of the taxation division has not lightened to any great extent.

In addition to work on specific cases, the Washington office has numerous conferences on proposed regulations and changes and on interpretations of the various regulations.

A full inventory of the work accomplished by the Washington office has been prepared by Mr. McCormack and is available to you upon request.

Many of you know that Mr. McCormack is not our only representative in Washington. We are fortunate in having there the efficient and affable Fayette B. Dow, who serves the institute in many ways, and who is of constant service to the departments of the government that have to do with oil. Mr. Dow is serving on committees of national importance, representing the institute. You will appreciate, of course, that Mr. Dow is in contact with the departments of the government which touch the petroleum industry, and is frequently called upon by the Department of Justice, Federal Trade Commission, etc., for information regarding matters which they are investigating for one reason and another, and by other departments and bureaus in connection with their activities affecting the industry.

Accounting Department

DURING the last year the accounting department has been continuously engaged with the institute's committee on Uniform Methods of Oil Accounting, the report of which has been presented to the board of directors.

This work is of primary importance to the industry as it will provide the means of telling its financial story in a correct and uniform way to the public, which is greatly desired.

This committee has deliberated and worked on the general balance sheet for two years and now feels that this balance sheet is final, subject only to such modifications as time and change of conditions will warrant.

In order to perfect this work it will be necessary to go to various oil regions throughout the country and to co-operate with representatives from the industry engaged in different activities such as refining, production, transportation and marketing. This work will go steadily forward. The plan is to have meetings of accountants and executives interested in the accounting problems in the different localities, which meetings will all be attended by Mr. Matti-

son, and from the results of these meetings it is hoped a uniform system acceptable to the entire industry will be worked out by the general committee on uniform methods of oil accounting.

The work done to date by this committee has attracted wide interest and attention throughout the industry and from the public, and this interest has resulted in considerable correspondence between the accounting division of the institute and various members of the industry who desired information on special accounting problems.

It is the intention of the institute, through its accounting division, to go eventually into many of the special accounting problems confronting the industry and to endeavor to work out for each and every one of them a uniform method of handling. By special accounting problems, I refer to such problems as joint lessee accounting problems; warehouse accounting problems; budget systems, etc.

This field is extremely broad, and it will require time to cover it intelligently, but inasmuch as the work appears to be desired and welcomed by the Industry, as stated above, it is the intention of the Institute to continue it to final solution.

Standardization

THE work of the various standardization committees on equipment is deserving of special comment at this time. As you all doubtless know, service on these committees is purely voluntary, and the results accomplished are due to the unselfish efforts and whole-hearted cooperation of several hundred executives, engineers, manufacturers and practical field men. They all should have your active support.

The publication this year of the new A. P. I. Handbook on Standards, containing various final and tentative specifications, is a distinct forward step toward the actual application of these standards in our everyday operations. The words "A. P. I. Standard" as applied to equipment should attain a practical significance during the coming year. Following is a brief review of the status of this work:

Belting

TENTATIVE specifications are now available in the new handbook for six different types of belting. The work of this committee is unusually difficult, in that it deals with so many different classes of material from which oil field belting is made. The committee is now carrying on extensive research work, particular emphasis being placed upon fatigue tests, for the purpose of determining final specifications.

Oil Field Boilers

This committee has adopted the A. S. M. E. code throughout on chemical and physical properties and tests. A uniform method of computing boiler horsepower has been adopted; namely, 10 square feet of heating surface equals 1 boiler HP. The area of the heating surface is defined as the total area actually in contact with hot gases, and shall be calculated as provided in the A. S. M. E. Boiler Code. Standard sizes and working pressures have been adopted, as well as a standard list of fittings for each size. These specifications are now available in the new handbook.

Cable Drilling Tool Joints

ELEVEN standard sizes of joints have been adopted. The necessary master gages have been purchased by practically all of the manufacturers of cable tool equipment, and also by many oil companies. Fifty-five companies have been licensed to use the A.P.I. monogram on cable drilling tool joints, and a complete list of these licensees is contained in the A.P.I. Bulletin No. 62 of Oct. 8. The specification not only contains the necessary specifications on sizes and threads, but also includes a recommended practice on turning the joint, the use of the gages, etc., all of which are necessary to insure a uniformly interchangeable joint. The cable tool joint specification is now available in the new handbook.

Oil Country Tubular Goods

SPECIFICATIONS in the new handbook are complete on casing, tubing and drill pipe. It is no disparagement of the work of the other committees to say that proper specifications on tubular goods are possibly the most important of any under consideration by the institute. Pipe usually represents the largest individual material cost in a producing or pipe line property, and it is vitally necessary that the best possible products be secured.

This specification is the result of the work of four committees: viz., the pipe committee, which formulated the casing specifications; the rotary equipment committee, which prepared the drill pipe specifications; the pumping equipment committee, which is responsible for the tubing specifications; and the A. P. I. correlating committee on gages and gaging practice, which formulated the types of gages and gaging practice. The specification contains the chemical and physical properties of the material, the sizes, gages and gaging practice, and a recommended system for gaging materials used with pipe, such as tool joints, drill collars, etc. I am informed that the gaging practice recommended in the A. P. I. pipe specification is a distinct step forward in the gaging of threaded tubular materials, and is but one illustration (of many that could be mentioned) of the benefits that will accrue to the oil industry from the work of these committees. Preliminary tests on the A. P. I. drill pipe conducted in California have been eminently satisfactory. Twenty-two manufacturers have been authorized to use the A. P. I. monograms on oil country tubular products.

Rig Irons

THIS specification provides for three standard sizes for rig irons, and five sizes of sand reels. It covers the essential standard dimensions which should insure interchangeability in the principal parts. Many of you are familiar with the difficulties and loss of time experienced in the field, due to the inability of an operator to secure quickly, at a critical time, a wrist pin of the proper dimensions, especially when drilling in an isolated locality with meager warehouse stocks. These difficulties should be greatly lessened as these standard rig irons get into general use.

This specification is also available in the new handbook. Eleven manufacturers have been licensed to use the A. P. I. monogram on rig irons, which indicates that the A. P. I. rig irons should soon become available.

Standard Rigs and Derricks

SPECIFICATIONS on heights, bases, openings through the water table, and the various dimensions of standard rig parts, such as band wheels, bull and calf wheels, etc., are complete. A code for computing the strength of derricks is now being prepared and when completed should be of great value to the industry. The necessity of having derricks of sufficient strength to withstand the heavy demands imposed by drilling, especially on fishing jobs, is well known. It is expected that the strength code will be completed at this session of the institute, and the complete specification will soon be available in the new handbook. It should enable the operator to purchase derricks with a better knowledge of the types required for his particular needs.

Rotary Drilling Equipment

DUE to the rapid growth in the use of the rotary method in drilling, the work of this committee is of especial importance. Standards on transmission are now complete, and provide for basic sizes of shafting, keys, chain and sprocket-tooth form. Rotary line shafts have also been standardized.

Exhaustive tests have been made during the last two years on the form of thread for tapered joints, and it was decided at the semi-annual standardization conference, held at Colorado Springs in June, to adopt the standard V thread for all threaded connections from the swivel to the fishtail bit. The committee at present meeting is now drafting the necessary specifications for the various sizes of drill pipe, and it is hoped that final specifications will be available early in the coming year.

This committee also prepared the standards on drill pipe which are included in the general A. P. I. pipe specification.

The advantages of standard threaded connections in rotary drilling are so

apparent that they need no additional comment from me, other than to say that they should be put into actual use at the earliest practicable date.

Wire Rope and Manila Cordage

TENTATIVE specifications are available on both of these materials. The formulation of specifications on wire rope and manila cordage is a particularly difficult project. These subjects are highly technical, and involve many elements not generally understood throughout the oil industry. The fact remains, however, that the committee, through the wholehearted and active cooperation of its members, has formulated a tentative specification which it is hoped will insure a uniform grade of material.

This committee has also paid particular attention to the question of proper care and use of these materials in the field and has incorporated definite recommendations thereon in the specification. Definite recommendations have also been made on the form of groove for sheaves, as well as other recommendations to equipment manufacturers, to prolong the life of wire rope and cordage.

It should be borne in mind that these recommendations are the result of careful thought and study on the part of men especially qualified by experience and research to make them, and they deserve the cooperation of the men in the field.

Pumping Equipment

STANDARD dimensional specifications are practically completed on working barrels and sucker rods. The committee is now completing the sections on gages and gaging practice. The thought should be kept in mind in all this work that aside from the question of deciding proper dimensional standards and tolerances, it is necessary, when gages are stipulated, to specify the methods by which such gages should be used, in order that a uniform size and class of fit may be maintained between the products of the various manufacturers.

This committee also formulated the tubing standards incorporated in the A. P. I. pipe specification, and is now engaged in preparing standards for working barrel parts, and a uniform method for rating internal combustion engines.

Tanks

A NATION-WIDE canvass, embracing all of the various oil producing districts has been made in order to ascertain the requirements on large steel storage tanks and tentative specifications are now under consideration at this meeting by the committee. Definite recommendations should be available early in the coming year. This committee is also preparing standards on small bolted and welded tanks for production uses.

In addition to the formulation of uniform specifications, the committees this year are planning to give particular attention to the proper care and use of equipment in the field. If we are to secure the full benefits from our standard specifications, it necessarily follows that such standardized material should be properly applied and cared for in the field. The entire group session on "Improvements in Production Methods and Equipment" this year is devoted to this question.

The Texas Co. Officials Inspect Properties in Southwest

Staff Special

HOUSTON, Dec. 4

OFFICIALS, directors and large stockholders of The Texas Co., who inspected southwestern properties on their way to the American Petroleum Institute sessions at Tulsa, were guests at a dinner Dec. 2 given by Houston officials of the company.

The party, which made its trip on a special train of eight cars, was headed by Chairman Amos L. Beaty and President Ralph C. Holmes, New York. Included in the party were John J. Mitchell, the veteran Chicago banker, and Arnold V. Schlaet, New York, who were among the founders of the company.

Mr. Beaty gave out an interview in Houston in which he said, "The year now about to close has been a good one for well managed companies. The annual slowdown in anticipation of winter did not occur this year as early as usual; it has not been extreme and good reports for the year may be expected. This is true in our own case, though we shall not reach the fantastic figures that have appeared in some publications.

Fearless of Overproduction

I DO not worry about overproduction of crude. Consumption increases from year to year and the end is not yet. At a time when the government is solicitous about the supply and its continuance to meet the growing demands of this country it would seem strange if the oil industry should go into a panic on account of temporary overproduction."

President Holmes referred to "some signs of a slight excess production," but described business as normal with The Texas Co., and apparently with the oil industry throughout the country.

Mr. Mitchell indicated that the company's earnings in 1926 would be about $40,000,000.

T. J. Donoghue, vice-president of the company at Houston, presided as toastmaster at the banquet at the Rice hotel. Those attending the dinner were:

Amos L. Beaty, New York; R. C. Holmes, New York; Arnold Schlaet, New York; Wallace C. Winter, New York; Henry A. Blair, Chicago; Orson C. Wells, Chicago; R. A. Rogers, New York; William W. Garland, Los Angeles, Cal.; William D. Sewall, Bath, Maine; B. D. Hade, Boston; George C. Allen, New York; Henry U. Harris, New York; Ralph E. Covero, New York; Henry C. Lapham, Boston; John H. Lapham, San Antonio; Edward F. Swift, Chicago; Walter H. Wilson, Chicago; J. R. Jewett, Cambridge, Mass.; C. L. Sargent Jr., Boston; C. B. Ames, Oklahoma City, Okla.; T. J. Donoghue, Houston; G. L. Noble, Houston.

Ira McFarland, Houston; Ernest Carroll, Houston; B. E. Hull, Houston; Frederick T. Haskell, Chicago; Philip Swift, Chicago; John J. Mitchell, Chicago; John J. Mitchell Jr., Chicago; E. J. Birmingham; Robert Hunter, Pasadena, Cal.; H. T. Klein, New York; Reeve Schley, New York; W. S. S. Rodgers, New York; Carl L. Schlaet, New York; Stephen Peabody, New York; Robert A. Gardner, Chicago; Charles H. Schweppe, Chicago; Albert Rockwell, Warren, Pa.; Roscoe Crary, Chicago; Mindor D. Crary, Warren, Pa.; L. R. Smith, New York; J. Ford Johnson Jr., New York.

P. C. Scullin, New York; W. H. Wagner, Houston; Guy Carrol, Houston; E. H. Catlin, Houston; C. K. Longacre, Houston; R. F. Baker, Houston; A. M. Donoghue, Houston; T. J. Lawhon, Houston; W. O. Crane, Houston; Tom M. Taylor, New York; J. C. McCue, Houston; A. H. Culver, Houston; L. R. Holmes, Houston; F. T. Manley, Houston; Arthur Lefevre, Houston; D. J. Moran, New York; T. E. Duggan, Houston; Jesse H. Jones, Houston capitalist; H. R. Safford, executive vice-president of Missouri Pacific, Houston.

California Marketers Move

LOS ANGELES, Dec. 2.—The offices of the Independent Petroleum Marketers Association of California have been moved from the Rives-Strong Bldg. to 1006 California Bldg., 2nd and Broadway, Los Angeles, according to H. H. Maxson, secretary-manager.

The association's offices include the oil men's credit bureau, the California Petroleum Exchange, and offices of George J. Tapper, attorney.

FINDLAY, O.—B & B Oil Co. is installing three 3000-gallon tanks for lubricating oil at its plant here, and also a tank for mixing and compounding. The company is erecting an office building at its bulk plant here, according to H. R. Beamer, manager.

Care and Use of Belting in Production Branch of Oil Industry

By David L. Trax
Gypsy Oil Co., Tulsa

Read Before Group Session on Standardization and Improvement of Oil Field Production Methods and Equipment, A. P. I. Annual Meeting, Tulsa, Dec. 8

MOST users of belting probably look upon this as one of the simplest forms of equipment which they have in use. It is perfectly obvious that if a belt is put around two pulleys and power is applied to one of them by a shaft, the belt, if of proper size and under suitable tension will make the second pulley rotate in turn driving the shaft and machinery as desired. This drive is in the majority of cases, the most practical means of power transmission. Recent developments in the oil industry have forced recognition of the fact that belting is no longer merely a necessary evil, to be selected at random, installed and operated by rule of thumb methods, but is an essential and important part of the machine, requiring and deserving as much care and attention as any other part of the equipment. If belting were considered more a part of the machinery and the same care taken of it, more service and economical results would be obtained.

Belting used in gasoline plants and refineries will not be discussed at this time, due to the fact that these places offer ideal conditions for belting and not much trouble is experienced in the use of same. Loss of production and time has been enormous, involving large expenditures due to belting in the operation and development of producing properties, hence it seems feasible that we should discuss the use and care of belting in this particular branch of the industry most extensively.

Selection of Belting

IN the construction of pumping plants whether individual or collective, the size and kind of belt to be used should receive as much consideration and attention as the rest of the machinery, so that pulleys or drives may be installed to fit the required belt.

With many of the larger oil companies employing engineers there is no excuse for certain jobs being underbelted as it is just as simple to determine the proper size belt to transmit a certain load as it is to determine the proper size engine to pull the load. Where engineers are not available, I believe the operator should act on the recommendation submitted by the belt salesman or the manufacturer as to the width and thickness of belt to be used.

With deeper drilling and heavier loads the 10-inch wide belt which was considered standard, is rapidly going out of use and wider belts becoming more common. It has been found by experience that a wide, thin belt will give longer and better service than a narrow thick belt, due to the fact that the wide belt offers a greater area of contact on pulleys preventing slippage, while the thinness decreases the internal friction of belts in bending around pulleys.

Fasteners

AFTER proper selection of the belt the fastener should receive due consideration. A belt is no stronger than the fastener which joins the ends together. It has been found by actual test that where the ends of belt are joined by fasteners that the strength at this point is only 50 per cent of the actual tensile strength of the belt. Also, from a recent analysis of belt trouble, I have found that 60 per cent of this trouble is at the fastener or originated there, hence the elimination of this source of trouble would be a large factor in oil field operations. Most of the larger belts being subject to sudden shocks and strains require the strongest type of fastener obtainable.

Wherever the installation is such as to allow a certain amount of take-up in a belt, an endless belt will give the best service. Any kind of belt can be made endless at the factory but it has always been deemed impractical to do this in the field, leather belting excepted.

The standardization committee on belting of the A. P. I. is now doing some research on fasteners and it is possible that in the near future certain recommendations will be made to the oil industry. It seems to me, however, that a fastener must be developed that will join the belt end to end rather than turning the ends up at sharp right angles and clamping.

Pulleys

THE pulleys should be of as large diameter as will work favorably in connection with the other factors of the drive. The larger the diameter of the pulley, the less the belt is flexed in going around the pulley, consequently the less internal strain there is on the belt. The area of contact between the belt and pulley is greater, thereby dividing the load over a greater surface. The belt also lays closer to a large pulley and consequently slips less on it.

All pulleys should be carefully centered and balanced and the shafts carrying them should be perfectly in line, parallel and in the same plane. The distance between centers should be as great as possible up to reasonable limits. The distance for narrow belts and small pulleys need not be as great as for wide, heavy belts. The A. P. I. has standardized on 40 feet between centers for beam wells and drilling wells. A greater distance causes the belt to run with a wavy motion.

Pulleys for oil field work should be at least two inches wider than the belt they are to carry.

Installation of Belt

WHEN installing a new belt, it should be put around the pulleys and the ends pulled together by means of belt stretchers. A new belt has considerable stretch, but it should not all be removed the first time. The tension in the belt should be just enough to prevent slipping. After pulling together, the ends should be cut, using a steel square and a sharp knife. A crooked belt end, even if it is off only a sixteenth of an inch will cause the belt to be joined crooked, the tension will be uneven and the belt will not run straight on pulleys. After cutting the ends, the belt clamp should be lined up with a square and holes marked. The holes should be punched by means of a belt punch which should be one-sixteenth of an inch smaller than the bolts to be used. This allows the bolts to fit snugly and does not cut away so much of the belt. The clamps may then be applied and the bolts carefully tightened, being sure that all bolts are fitted properly in squares provided in clamps. After removing stretchers the belt may be put in motion slowly and observed whether it runs in the center of pulley. If not, adjustment should be made at once by aligning pulleys or shafts.

Care of Belts

THE clamps or fasteners should be inspected regularly for loose or broken bolts.

When a belt begins to slip it is either too loose or is overloaded. In the first case it should be cut as soon as possible. in the latter case a larger belt should be used.

Belt stretchers should be used when cutting belts in order to get the proper tension. If the belts are placed on pulleys under too much tension, both

the belt and the bearings have to stand the strain of this excessive tension and the efficiency of the drive is reduced as a result. The old method of nailing belt to band wheel, then treading on fly wheel of engine to put on a belt has caused large losses in belting and equipment, but is now becoming obsolete.

Belts should never be allowed to run partly off the pulley because they will be cut and broken where they overhang the edges of the pulley and be rapidly destroyed. A two by four or piece of pipe should never be placed beside a belt to keep it on the pulleys, but correction made by aligning pulleys.

It is generally well known that lubricating oil is detrimental to most belts, hence rigid steps should be taken at all times to see that belts are kept free of it. Guards or pans should be installed if necessary.

Little attention is paid to the condition of the belt houses at beam wells. These houses should be kept in good repair in order to prevent sand, rain or snow from blowing in on the belt.

Counterbalances aid greatly in relieving the shock stress on belts, hence all wells and powers should be provided with counterbalances and these kept in repair at all times.

Belt Dressing

IF a belt requires a dressing to prevent it from slipping, it is either too loose, its load is too great, or the design of the drive is defective.

Without doubt belt dressings are an evil and can only be regarded as a temporary expedient to help over a hard place. They should not be necessary ordinarily, but in some cases there exists an inability to shut down and eliminate the cause of slipping.

Practically all "patent medicine" belt dressings are injurious. Nearly all contain mineral oil, grease, rosin or beeswax. Any of these ingredients are harmful to the material of the belt and are apt to gather in lumps both on the belt and on the pulleys and reduce pulley adhesion, increase the tendency to slip, and cause premature separation of plies in case of rubber belt.

In no case should any solid or gritty substance, such as sand, dust, rosin, tar, paint, paraffin, soap, melted rubber, etc., be used to prevent slipping.

If it is necessary to use a dressing on rubber belts, vegetable castor oil or boiled linseed oil may be used in small quantities. These oils are not injurious to the belt but will modify the surface, increase pulley adhesion and permanently reduce the slip.

In the manufacture of hair belting, the belt is impregnated with a preservative which also tends to lubricate the hair strands, and prevent internal fraction. After constant service for some time a hair belt may become hard and dry, so that it is necessary to lubricate it again.

Vegetable castor oil or boiled linseed oil may be used for this purpose. Cotton, woven and stitched canvas belting may be treated in the same way.

Like the hair belt, the fibres of the leather belt are lubricated at the factory and after constant use becomes dry and hard. A mixture of beef tallow and cod liver oil may be applied to the belt on the driving side. This mixture oxidizes and the gummy surface formed gives the belt a smooth elastic driving force.

Conclusion

Under no conditions can belting be expected to compensate the operating defects of pulleys too small or too narrow, of excess loads and slow speeds, of high tension, short arcs of contact, or of the many other faults for which it is not responsible, but which it is called on daily to correct in the oil industry. A good belt will do more work and do it better under adverse conditions, than a poor one, but that is all.

No one kind or type of belting will serve all purposes with equal satisfaction, or give a maximum return on unit of cost, no matter how or where employed. The types and makes of belting from which one must choose are many and it is no simple matter to make a decision. Every drive is surrounded by its own peculiarities and every type of belting has its own advantages and disadvantages.

Many belting troubles will be obviated and a far higher percentage of effective work secured with less loss of production if the proper size and make of belt is determined for each individual job.

Also by using the best belt clamp or fastener available and effecting the proper care and attention to belting in the field, much belting trouble may be eliminated. To this extent I wish to recommend the keeping of belt records on each belt in use. By use of belt records the service obtained from certain belts may be noted and future installations may be changed so that longer service may be derived from belts.

The operating conditions in the oil industry with its diverse factors and its constant changes and improvements must be a continual source of study in order to select the proper belt and obtain maximum and efficient service of belting.

Protecting and Reconditioning Underground Pipe Lines

By C. R. Weidner
Chief Engineer, Prairie Pipe Line Co.
Read Before A. P. I. Annual Meeting, Tulsa, Dec. 7, 8 and 9

CORROSION in underground pipe lines exacts an annual toll in the United States of at least $100,000,000. Small wonder there is a growing interest in the subject of corrosion and a noticeable increase in discussion of ways and means to overcome that waste.

In technical circles the prevention of corrosion is arousing nation-wide discussion. Much good has come already from the increased public and engineering discussions but, notwithstanding the knowledge of its tremendous economic significance, science has been slow to find a permanent remedy.

Although the writer is unable to offer anything new or original about the subject, this paper was prepared for the purpose of keeping alive the discussions, and to describe briefly the methods used by one of the larger pipe line companies, to combat corrosion and recondition pipe lines after corrosion has taken place.

Types of Corrosion

THREE distinct types of corrosion have been observed in underground pipe lines. The first is characterized by uniformly distributed scale over the entire length of the pipe and resembles atmospheric corrosion. When badly corroded, the scale sloughs off in thin layers.

The second type is characterized by rather shallow and uniformly distributed depressions, resembling somewhat a piece of sheet copper that has been ball peened. The third type is known as pitting and is the most prevalent. It is distinguished by deep depressions, often of irregular shape and size, which eventually perforate the metal and cause leaks. Pitting is localized corrosion; it often being observed that the metal, only a few inches away from the pit, is almost as good as new.

Pitting is the great source of trouble in pipe line maintenance. Due to this type of corrosion the life of a particular stretch of unprotected pipe, in especially corrosive soil, often is less than five years, while uniformly corroded pipe has

a life of 20 or more years under average soil conditions.

Methods Used to Combat Corrosion

THERE are four different methods in which to attack the problem of preventing underground corrosion.

1. By insulating and grounding the pipe against electrolysis.

2. By modifying corrosive soil conditions.

3. By manufacturing more corrosion resistant pipe material.

4. By the use of protective coatings that keep the metal free from moisture and the deteriorating constituents of the soil.

Electrolysis due to stray current is not common in oil pipe lines. Considerable development in electrolysis mitigation has been made in recent years, and the published information on this subject is quite extensive, so it will be dismissed here without further comment.

Modification of corrosive soil conditions, through the use of chemicals or drainage, has been tried with varying success. Hydrated lime used alone or mixed with sand, to reduce or neutralize the corrosive agents, has given good results in some soils. It is a well known fact that the bottom of the pipe corrodes and pits more rapidly than the top and sides. This is thought to be due to the collection and retention of ground water at the bottom of the ditch.

Therefore, it will be of considerable advanatge to drain the ditch, wherever it can be done economically, unless the soil is sufficiently porous to drain itself. Supporting the pipe a little above the bottom and back filling the trench with broken stone, gravel, or sand, has been suggested for the purpose of drainage in very wet and dense soils.

This also reduces the danger of localized corrosion caused by dissimilar soils in contact with the metal. However, unless such materials are available, at low cost, it will be generally more economical to use protective coatings.

Corrosion Resisting Pipe

THE manufacture of more corrosion resistant pipe material is a problem for the metallurgist. There are now available certain alloy steels, such as nickel and chromium steel, that are known to resist corrosion better than ordinary steel or iron, but they are too expensive and too difficult to work to warrant their use in the manufacture of pipe. Copper steel is comparatively resistant to atmospheric corrosion. It can be manufactured at reasonable cost and worked easily, but it is subject to dilute acid corrosion and, therefore, not suitable for underground use. Considerable progress has been made in the production of corrosion resistant ferrous alloys, but until these materials can be produced at a low cost and can be rolled and welded, we must depend on steel and wrought-iron for high pressure pipe lines.

By far the most common, and generally the most economical, method to protect underground pipe lines against corrosion, is to use a suitable coating to prevent the metal from coming in contact with soil and water. Regardless of the theories of corrosion, it is certain that if all corrosive agents are definitely and permanently cut off from the metal, corrosion can not occur.

In the case of underground pipe this virtually means excluding ground water, although all ground waters are not dangerously corrosive. Exclusion of water will also prevent automatically the contact of the metal with acids, alkali, vegetable matter, and, in most instances, air or gases. The problem, therefore, is one of waterproofing the pipe.

Protective Coatings Available

THE protective coatings available for underground pipe lines are:

1. Paint,
2. Bituminous, dipped or poured,
3. Fabric reinforced bituminous,
4. Portland cement,
5. Metallic.

Many varieties and kinds of protective coatings are now on the market, each class possessing certain characteristics. The essential fundamental quality of a protective coating is that it must seal the pipe from contact with corrosive agents. All of the above coatings, when properly applied, have certain corrosion resisting qualities. The problem for the engineer is to select the best coating for a particular condition, and to see that it is applied properly.

As in most engineering work, this is an economic problem. The question arises how long will these coatings protect the pipe and at what cost? To answer this question the engineer needs a series of tests extending over a considerable period of time, and under practical conditions, to determine accurately the rate of corrosion, or more especially the rate of pitting, for unprotected pipe in different soils, as well as the effective life of various kinds of coatings. Information available at the present time on the stability of various coatings under different soil conditions is very limited.

Preparation of the Surface for Applying Paint and Bituminous Coatings

NO matter how good the materials used in protective coatings may be, unless they are applied properly their purpose will be defeated. The surface of the metal must be cleaned of all loose mill scale, rust, dust and all traces of oil and grease, if good results are to be expected.

Even new pipe should be cleaned to remove the mill scale. Mill scale is electronegative to iron and steel, and when immersed in water tends inevitably to stimulate pitting. Examination of corroded pipe shows signs that pitting often starts around the edges of mill scale.

Loose scale and rust can be removed by pickling, sand blasting, wire brushes, scrapers, hammers and files. In the field the pipe is most economically cleaned now with portable pipe cleaning machines. Grease, oil, or dust should be removed by washing the surface with a volatile distillate.

In applying paints and bituminous coatings great care should be taken to have the surface perfectly dry. Heaters should be used for this purpose when there is frost, dew or rain on the pipe, as it is not always practicable to wait for suitable weather conditions. Impurities attached to the surface affect corrosion more than has been generally realized. Many past failures were no doubt due to improper preparation of the surface or improper application, rather than faulty materials.

Paint Coatings

THE primary consideration in choosing a paint is good adhesion. It also must not contain in its pigment or vehicle, any substance which is chemically active in such a way as to carry oxygen to the metal. Should such an agent be introduced, it will promote rather than prevent corrosion.

In general, red lead, zinc, and graphite paints mixed with linseed oil are not suitable for underground use. These paints have a comparatively low initial adhesive strength, and they are, moreover, far from impervious.

Paints with a coal-tar of asphaltum base are most frequently used and have given better results. Commercial paints of this kind may contain air-slacked lime, tallow, resin, cement, para rubber, gilsonite, silica, soapstone, China-wood oil, and chromates.

Except in slightly corrosive soils, one coat of paint is not sufficient to protect the metal for any considerable length of time. Such a thin coating, usually not over one hundredth of an inch in thickness, allows moisture to penetrate through pin holes and hairline cracks. In more recent practice, paints, unless reinforced with some filler, such as asbestos fibre, so that a thicker coating may be applied, are more often used as a priming coat, over which a thicker bituminous coating is applied.

The function of the priming coat is principally to afford a strong bond between the thicker protective coating and the metal. It is essential where the subsequent coat is applied hot to the cold metal. The priming coat is of little protective value in itself, as is true of paints in general when placed underground. To be of any practical value, where underground corrosion is known to occur, a non-porous coating of substantial thickness is required.

Bituminous Coatings

BITUMINOUS coatings consist of refined coal-tar pitch, natural asphalts, and artificial blown asphalts. Coal-tar pitch has been used for many years with good results. The range between the

brittle and melting points of this material is only about 45 degrees F. This is a disadvantage when the pipe is subject to a wider temperature range, as the material may either run off or crack. However, if it is applied in the field and the pipe is buried soon, this is not a serious disadvantage, as the trench temperature range is within the limits of plasticity of the material.

The asphalt mixtures have a temperature range between brittle and melting points of 130 degrees F. Asphalt mixtures differ mainly in the amount and character of the soluble bitumen and insoluble mineral matter which they contain. Fillers, such as cement, ground slate, soapstone, sand and limestone, are often mixed with the bitumen, to permit the use of a softer and more sluggish coating and a wider range of plasticity. Asphalt coatings have also proven quite satisfactory in service but, as asphalt is solvent in crude petroleum, some trouble has been experienced with oil pipe lines when collar leaks develop. When properly refined and applied there is but little, if any, difference in the protecting qualities of either coal-tar or asphalt.

Bituminous coatings are applied either by dipping, pouring or mopping. Dipping is done at the pipe mill in a tank of hot compound. Single dip coatings average about $\frac{1}{32}$-inch in thickness and are only suitable for mildly corrosive soil. In applying a bituminous coating in the field, the pipe is first given a priming coat of the same base as the outer coating and allowed to dry. The outer coating is then poured on top of the pipe, and the surplus that drains off the pipe is caught in a canvas sling under the pipe. The sling is then brought in contact with the bottom and sides of the pipe and is pulled up and down, so that the pipe is thoroughly and uniformly covered with the material. In this way a coating may be applied up to ¼ inch in thickness. Instead of the sling a mop is sometimes used like a paint brush to spread the material.

Mill coatings are subject to severe abrasion in shipping and handling but, on the other hand, it is easier to obtain a clean surface and a more uniform covering at the mill. Coatings poured in the field are not subject to such large temperature changes and can be applied much thicker than dip coatings.

Under bituminous coatings there may be classified a preparation of a petroleum base, into which properly compounded chemicals, such as chromate salts, have been introduced. It is non-hardening, resembling axle grease or vaseline, and is made in several degrees of consistency. Good results have been claimed for this coating.

Reinforced Bituminous Coatings

WHEN corrosive conditions are severe, bituminous coatings can be reinforced with a fabric, such as burlap, rag felt, or asbestos felt, which improve their resistance to abrasion and corrosion. The fabric serves to prevent injury to the protective coating, and to retain a greater thickness of bitumen on the metal. The felts are saturated at the factory with a waterproofing compound and are shipped in rolls like roofing paper. They are made in several weights and thicknesses.

Reinforced coatings can be applied at the pipe mills with machines, that wrap the standard fabric spirally around the dipped pipe. Application at the mill offers better control of materials and inspection, but the coating is subject to injury especially in laying screw pipe, and in shipping. When wrapped at the mill an additional wrapping must be made in the field at the coupling or weld after the pipe is laid.

When reinforced coatings are applied by hand in the field, the pipe is first given a priming coat and allowed to dry. Next, a coating of asphalt or coal-tar cement is poured or mopped over the entire circumference of the pipe. Then, while this coating is still hot, the fabric is wound around the pipe and the lapped joints sealed with the cement. The wrapping may be done either length-wise, cross-wise, or spirally. When wrapped length-wise, greater care must be taken to secure a uniform bond and to prevent air pockets.

Over this wrapping another coating of cement is applied, thus making a thickness of about ⅛ inch of protecting material. In this manner two and sometimes three layers of covering material may be applied to combat very corrosive soil.

There is a portable pipe wrapping machine on the market, which wraps the fabric spirally in the field, but as the pipe has to be revolved, it is not applicable to covering laid pipe.

Portland Cement Coatings

A GOOD rich grout of Portland cement properly applied is the most permanent protection against underground corrosion yet devised. This type of protection is very expensive. Hence, it should be used principally for permanent trunk lines, and only under extremely corrosive conditions. Pipe lines in salt marshes have been protected in this way for over 25 years with but little maintenance. Concrete made with a small aggregate is also used for this purpose, but unless a rich mixture is used it is apt to be more porous.

The cement grout or concrete is most economically applied with the use of steel forms, in which the pipe has been centered. A grout consisting of one part of cement to two parts of clean sand is thoroughly mixed and poured into the forms, so that the coating will be about two inches in thickness. A bituminous priming coat should first be applied to the pipe. Portland cement coatings are subject to disintegration in some alkali soils and are not proof against electrolysis.

Metallic coatings for underground pipe lines have not been used extensively, except for small water lines. When so used the coating most commonly consists of zinc, as it is anodic to iron. Lead coatings have also been used, but as lead is cathodic to iron, it accelerates corrosion at places where the base metal is exposed.

Lead is applied by an electroplating process, while zinc is more generally applied by the hot dip process, which is known as galvanizing. Galvanized pipe is only efficient in slightly corrosive soils. Lead covered pipe may be perforated very rapidly, where there is a pin hole or break in the metal. In general, better and more economical results can be obtained with non-metallic coatings, than with metallic coatings for underground pipe line protection.

Summary of Protective Coatings

ALTHOUGH there are available a considerable variety of protective coatings having certain corrosion resistant properties, the problem is to choose the best or most economical one to meet certain conditions. The choice depends on a number of factors.

1. The service life of the pipe line.
2. The physical life of the unprotected pipe.
3. The physical life of the protected pipe.
4. The cost of the pipe line.
5. The cost of the protective coating.
6. The cost of repairs.
7. The future cost of replacing the pipe line.

All of these factors are variables, which makes the problem quite complex. However, some of these factors can be estimated fairly accurately, but, until further data on the physical life of protected and unprotected pipe in different soils are available, the answer to the problem can only be estimated roughly. The best thing that can be done at present is to make an estimate of the yearly depreciation of unprotected and protected pipe. Then, compare the difference to the interest and depreciation on the cost of the protective coating.

The greater the saving that can be effected, the better the coating material other things being equal. Thus, assuming

A=$10,000=Cost of an 8-inch pipe line per mile.

B=5%=Annual rate of depreciation for the unprotected line.

C=4%=Annual rate of depreciation for the protected line and coating.

D=$1,000=Cost of the protective coating.

E=5%=Interest rate.

Then:

$10,000 × .05=$500=Annual depreciation for unprotected pipe.

$10,000 × .04=$400=Annual depreciation for protected pipe.

$1,000 × .09=$90=Annual interest and depreciation on coating.

$500—$490=$10=Saving per year due to coating.

$$AB-AC=D\,(C+E)$$

$$A(B-C)$$

$$D=\frac{C+E}{100(A+D)}=\text{The maximum amount to be expended for 100 coating.}$$

$$\frac{AB-DE}{B}=\text{The minimum economic increased life of pipe in years.}$$

As a rough estimate the increased life of the protected pipe and the cost of coatings may be taken as follows:

	Increased life in years	Cost per mile
Paint coatings	1	$ 100
Bituminous coatings	3	400
Reinforced bituminous coatings, Single ply	5	600
Reinforced bituminous coatings, Double ply	7	900
Portland cement coatings	20	3000
Metallic coatings	5	1500

Reconditioning Pipe Lines

PREVIOUS to five years ago the oil lines of the company, with which the writer is connected, were laid without any protective coating except a thin coat of coal-tar or asphalt paint. Some of the lines have now been in service over 20 years and need extensive repairs. In the case of such old lines, it becomes more economical to uncover the entire line and recondition it for its hurried very much. Hatching eggs is entire length. For this purpose the oil is diplayed by inserting a scraper and pumping water into the line behind it. The pipe is raised out of the ditch with windlasses and thoroughly cleaned with a pipe cleaning machine, augmented with wire brushes, files and hammers. Special care is taken to clean out the pit holes thoroughly. Examination is then made to determine such portions which have been corroded so badly, that it would not pay to weld the pits. These portions are then cut out of the line with a cutting torch and replaced with new pipe.

Generally such replacements do not exceed 10 per cent of the length. Threads and couplings are examined carefully and, if defective, they are replaced with new pipe welded into the line. The deep pit holes in the remaining portion of the line are then filled in by oxyacetylene welding. Failures due to pit welds have been practically negligible.

The pipe line is then given a suitable protective coating and replaced in the ditch. In this manner 8-inch pipe can be reconditioned at a cost of about $2500 per mile, and the life of the line probably will be extended 10 years. A large portion of this expense is due to uncovering of the pipe and back-filling the ditch. In reconditioning old lines some soil conditioning might be used to advantage, as it is then known just where the bad oils occur.

In reconditioning pipe lines between northern Texas and northern Illinois, there is no noticeable difference in the number or distribution of the pits in the various states. It has been noticed, however, that most of the pits occur in poorly drained soil, and that the pits are more numerous on the bottom of the pipe. Pit leaks average about five per mile per year in 8-inch pipe, that has been in the ground 10 years. One of the peculiar things about pitting is, that it occurs in comparatively new pipe, and may only affect a small portion of the joint, while the rest of it is practically as good as new.

Conclusion

UNTIL metallurgists are able to produce better pipe material within economic limits as to cost, some kind of protective coating is usually desirable for insurance against corrosion in underground wrought-iron and steel pipes. The several types of protective coatings described have been developed through experience to fit certain conditions. All of them afford a certain amount of protection, when properly applied. The selection of the most suitable coating is an economic problem depending on a number of variables, which at present can not be evaluated accurately. The problem is complex and until more experimental data are available, the solution can only be estimated from past experience with the different coatings. No panacea for corrosion trouble has yet been found but excessive losses can undoubtedly be diminished by further study of the problem.

Selection and Care of Equipment

With Special Reference to Engines and Pumping Equipment Used in Production of Petroleum

By Hollis P. Porter

Gypsy Oil Co., Tulsa

Read Before Group Session on Standardization and Improvements in Oil Field Production Methods and Equipment, A. P. I. Annual Meeting, Tulsa, Dec. 9

LARGE central power plants, mills, refineries, mining and smelting plants all have equipment which is carefully selected and it is well cared for. The subject to them is one that offers no problem. They have had all plans well laid before installations were made and have become accustomed to the employment of deliberate preparations and thorough engineering before equipment is either purchased or installed.

When installed it is so well suited to the service to be done that its care is only a minor problem hardly thought of by the officers above the chief operating engineer.

This condition is more difficult to bring about in the production of oil. There is no time to deliberate when drilling is in progress. The kind of equipment cannot be determined until the well is completed. The rapid changes that take place, the uncertainty as to what will develop in a producing oil well, and the temporary character of each change that comes in the history of producing oil fields all prevent deliberate and well laid plans as to equipment. This and the necessity for economy in first cost of temporary installation tend to make care of equipment most difficult.

One great improvement toward economy in methods of operation could be brought about by co-operation among different producers in the same field so that the development and production work can be carried on with more deliberation. This would often prevent hasty and improper installations which must be followed by expensive changes and difficult maintenance.

The care of equipment depends to a great extent upon the care with which the equipment has been selected and installed. A rig-front that shakes, a foundation poorly built, a machine or belt drive improperly aligned, a polish rod weaving, on a long stroke and many other such defects cause no end of expense and work which makes trouble in taking care of the equipment. All such troubles can be reduced by exercising more care in the work of selecting and installing equipment.

By referring to page 80 of the Nov. 11, issue of The Oil & Gas Journal, an article by Glenver McConnell gives some valuable points in the selection of equipment, and I would advise those interested to look it up.

Engines

AN internal combustion engine should be selected with ample margin of power. The load to be determined as

accurately as possible first, and then the engine should be selected which is capable of doing 25 per cent more power as determined by Prony brake test at the speed desired with fuel of the same heat value as that to be used. Likewise scientific selection of boilers, pumps, etc., will greatly reduce the cost of operation and prolong the life of the equipment in addition to producing greatly increased results generally.

One might write a large volume describing the different individual parts of equipment and their care, beginning at the bottom of the well and extending up the tubing including sucker rods, belts, clutches, engines, pumps, tubing valves, etc. It is too much to expect that all the items can be described and their care recommended in one short paper, such as this. There should be liberal discussion among producers and operators, each supplying some good practice that he can recommend for care of certain equipment.

Tubing

TUBING in wells which gives trouble on account of corrosive gas or water has, in many cases, been painted with good results, using a protective coating. In other cases, wrought iron tubing has been employed. There is also upon the market copper bearing seamless tubing, which contains about .25 per cent copper. Experiments have shown that copper bearing steel with a copper content of .20 per cent to 1 per cent increases the resistance to corrosive action very much and the cost is reasonable. Where non-corrosive material can be used in equipment, its care is very much minimized.

The care of sucker rods is very important as it reduces the trouble with the pumping well. Sucker rods should never be allowed to come in contact with the ground nor allow the threaded joints to become dirty and the threads filled with sand or grit. They should be handled with care to prevent bending.

Many operators provide a trough 50 or 60 feet long where the rods, two lengths together, can be laid as they are pulled from the well. Also, there are several kinds of rod hangers on the market. These are designed so that the rods are suspended in the derrick.

Care to see that the threads are clean, the use of oil on threads as joints are made up, and care that each joint is made up to the shoulder will prevent breaks and parting of sucker rods to a great extent provided the rods are of proper size and quality to take care of the load. A sucker rod joint that will not make up to the shoulder should never be run in a well. It is better in case such a joint is found to stop, unscrew the rod and lay it aside or fix it so it will run.

In general it is important to keep all equipment clean and to paint in liberal quantities on all equipment where it will help to preserve it. There is absolutely no need for paint upon new galvanized iron, however. When a property and its equipment is kept clean and the buildings well painted, you can "bank on it" that the equipment on that property operates well.

The psychological effect of clean equipment, well kept, will pay in many ways. It creates harmony that affects the workmen and that benefits the whole operation.

Good Equipment Reassuring

ONE of our large gas companies, I am told, has discovered that by building better meter houses and painting them in an artistic manner, reduced the trouble that they had been having on account of controversy with the farmers who owned gas wells from which gas was purchased.

With ill kept meter houses the farmer could not believe the meter records were correct. As a result the saving in compromises had more than offset the extra investment.

Many valuable papers, such as the care of belting, and the care of several specific items of equipment which is employed in the production of oil, presented at these meetings are calculated to be instructive in the care of equipment. Also, the manufacturers of engines, boilers, tanks, tubing, pumps, and all other equipment have each a store of information which they are only too glad to furnish any one who desires to know about the care of their equipment.

By securing such prepared information and following instructions given along with the work in the field a great amount of good may result. It should be a practice of the office of all producing companies to encourage the men in the field to read and study the manufacturers' printed instructions about the care of equipment as well as to lay down certain definite rules to be followed in field operation.

Care and Use of Pipe in the Field

By T. D. Davies and J. B. Graham
National Tube Co., Pittsburgh

Read Before Group Session on Standardization and Improvements in Oil Field Production Methods and Equipment, A. P. I. Annual Meeting, Tulsa, Dec. 8

TRANSPORTATION, *safe* transportation, by rail, often by water, then by truck or team, that is the big problem. The manufacturers have been giving the matter of thread protection a very close study for years. A great variety of contrivances from cardboard rings to heavy rubber bands are constantly being presented to us for consideration. Nothing to take the place of a threaded steel ring has yet been devised. But there has been an improvement in the form of these rings, so that the ends of the pipe, as well as all the threads, may be protected.

The handling of pipe in the field begins with the unloading from cars. The practice of using a gin pole and team or truck is now almost universal.

Occasionally we see a type of hook used which bears upon the threads of the coupling. Such a hook naturally ruins the coupling threads and when the joint is made up, galling is almost certain to occur.

It has been our experience that the casing or other pipe is most often damaged in the teaming or trucking to the final destination. The thread protectors are not sufficient to protect the threads against rough handling, such as dropping the pipe off a truck or wagon, or rolling the pipe down a steep incline which permits the end of the pipe to strike against the side of another pipe. The difficulty, we believe, is that in some cases men in the field who have to do with the actual handling of casing and other pipe do not understand the nature of the goods with which they deal.

We find that the printed word has but little effect in correcting such matters, while concrete examples are the most effective. Consider that the limitations of gage size of the A. P. I. specifications permit a variation in pitch diameter of only .005 inch in the case of 10 thread, ⅜ inch taper and only .008 inch in the case of 8 thread, ¾ inch taper, then you will understand what a slight amount of out-of-roundness, resulting from rough handling, will make in the screwing up of a joint.

Casing Often Improperly Run

ASSUMING that casing from the time of cutting the cross wires on the car has been handled just as carefully as possible until the material has been unloaded on the casing rack at the well, a big problem still confronts the driller or superintendent who wants to make absolutely sure of handling a perfectly satisfactory string of casing, a string that can be broken down and

run again and again with results equally as good as obtained at first. Simple as the running of casing may seem, we find that, quite often it is improperly done. The observance of a few fundamentals means success in this work; their neglect makes failure almost certain.

It is the practice of some of the larger oil companies to post in every company derrick certain information for drillers. We believe a similar idea embodying rules for running casing, could be adopted profitably as a recommendation of the American Petroleum Institute. The card would of course be signed by the operating company on whose lease the well is being drilled. We shall head this, "Ten Rules for Running Casing," or if you prefer to make them more mandatory, "The Ten Commandments for Casing Crews." They would read somewhat as follows:

The Ten Commandments for Casing Crews

BEFORE running any casing, examine the elevators carefully, making sure that there is a good square surface for the couplings to rest upon. See that elevators, particularly of the gate type, are not worn nor sprung. Take no chances with equipment that appears to be in any way defective.

2. Remove the protectors from the top row of casing, then thoroughly clean the threads of pipe and couplings using a soft pine paddle, following this with a bristle brush and gasoline. If steam is used for cleaning the threads, make sure the thread surface is dry before applying the zinc dust grease. Do not use a wire brush and do not remove the protectors below the top row until all of this row has been run.

3. Inspect threads of pipe and couplings very carefully. File out with a small three-cornered file any threads which are closed up or slightly bruised, but lay aside any pipe that is badly damaged or has the ends of the pipe or coupling knocked out of round.

4. Clean six or more thread protectors with a brush and gasoline, or steam, and screw these on the first six pieces of casing near the walk that previously have been cleaned and inspected. As the casing is run return these cleaned protectors to the rack to be used again.

5. Lower each piece of casing carefully to the walk without dropping—use ropes if necessary.

6. Do not remove the protectors from the cleaned threads until the casing has been raised from the buggy in the derrick.

7. Give the threads of pipe and couplings a final inspection and coat the threads of each with zinc dust grease.

8. Stab each pipe carefully, taking care that the end of the pipe does not strike the face of the coupling. If the pipe drops into the coupling, or if it is permitted to tilt to one side after stabbing, lift it up, clean the threads, file cut any that are damaged, then apply another coat of zinc dust grease.

9. After stabbing use a casing pole or hand tongs for the first part of the screwing. This will enable you to tell if the joint has been properly stabbed. and if it will make a good fit.

10. Tighten the joint with tongs and jerk line, or by other power methods. For the last four or five revolutions, do not exceed the following speeds:

12 revolutions per minute for 6⅝-inch A. P. I. casing.

9 revolutions per minute for 8⅝-inch A. P. I. casing.

7 revolutions per minute for 10¾-inch A. P. I. casing.

For other sizes use proportionate speeds.

Check three methods against each other in determining if the joint is screwed up to the proper degree of tightness.

1. Note the action of the engine and jerk line, observing the force necessary for one joint as compared to another.

2. Note if there are any threads exposed back of the coupling. When a casing joint is screwed home, all, or nearly all, of the threads should be covered.

3. Place the bare hand on the coupling at frequent intervals. When the power method is being used, the coupling should get noticeably warm. If zinc dust lubricant is used, the joint can become quite hot to the bare hand without injury to the threads. However, if this occurs before the joint is about made up, something is wrong and the joint should be taken down.

The procedure which we have just outlined may seem to some like the use of unnecessary precautions which will involve loss of time and therefore extra expense. We believe the casing crews can be organized in such a way that the loss of time can be reduced to a negligible figure. But we think you will agree that not a saving of time, but safety, which in the end means economy, is the thing most desired.

We are not voicing our own opinions alone, but those of every pipe manufacturer's representative in the field, when we say that the hiring of casing crews at flat rates to run casing, without careful supervision and a set of fixed rules as to how material shall be handled, is not giving the casing a fair chance. The speeding up that results from flat rates or piece work rates, if a high standard of workmanship is to be maintained, always means extra checking and supervision.

Some companies consider the handling of pipe important enough to have a special man to look after the work. One of the large producers places this work in the hands of the mechanical department. Two casing racks are provided at each well. As the casing is inspected it is rolled from one rack to the other and casing crews are never permitted to run casing which has not been inspected by these representatives of the mechanical department. We understand that not a single casing failure has occurred since this practice was established about two years ago. If such a practice were generally adopted, or if the 10 rules we have outlined were conscientiously followed, much of the difficulty now experienced with casing could be avoided.

Underreaming

BEFORE leaving the question of the care of casing, we believe something should be said about the process of underreaming. We refer to the practice incidental to cable tool drilling. The fact that practically every instance of parted casing which we have heard of in the last five years has been on an underreaming job, is not without significance. The failures usually occur after the hole has been drilled ahead of the casing and the casing has been raised 8 or 10 feet just preparatory to underreaming. The failures of these joints seem to be entirely a question of friction on the outside of the string, although it may be possible that previous underreaming has injured the casing in some way. As far as we know, no precautions are being taken to keep the casing free during the intervals between underreaming periods while drilling is in progress. The result is that the casing freezes or becomes logy and it is not surprising under such circumstances that casing will pull in two when an attempt is made to raise it.

We are now experimenting with a dynamometer, reading the actual loads which are being put upon casing in this operation of underreaming. By attaching this device to the dead line, loads up to 300 tons can be recorded. It is not our thought that such an instrument could be applied to casing dead lines as a general practice, although an automatic recording device in connection with such an instrument might be a revelation to some operators as to what their men are doing with their casing. Our principal idea was to obtain the approximate amount of stretch in strings of casing under certain definite loads so that this could be given to the driller as an indication of what he could safely do with any size and weight of casing. Unfortunately we have not been able to gather sufficient data that figures may be reported at this time.

Strength of Casing Joints Under Tension

THERE seems to be a general opinion that the longer the coupling and the longer the thread on the pipe, the stronger will be the joint. This is true only to a certain point. The tensile strength of a threaded connection never can be greater than the ultimate strength of the net area of metal below the root of the first perfect thread. This

is the last thread toward the shoulder of the pipe which is in engagement with the threads of the coupling. The coupling and thread might be lengthened indefinitely, but no additional strength would be added to the joint beyond a length necessary to cause the pipe to break off at this point.

We find that 90 per cent of the calculated strength for the smaller sizes, and 75 per cent to 85 per cent for the larger sizes is all that can be assumed for the net area of metal below the first perfect thread.

When a threaded pipe joint has been pulled in two the pipe threads usually have the appearance to the eye of not having been injured at all. The applied force having been in a line parallel with the axis, the threads of the pipe have acted as a series of wedges tending to compress the walls of the pipe and, to a lesser extent, to expand the coupling. Accompanying this action there is usually an elongation of the pipe in the threads, located principally at the first full thread near the shoulder of the pipe. This elongation or stretch usually amounts to .010 inch or .020 inch per inch and is nearly always confined to one side of the pipe.

Very often after a hard pull upon a string of casing the joints near the top are found to be loose. This condition indicates that the material below the root of the threads has been stressed beyond its yield point, and in this case there is a deformation of the pipe at the threads although the applied force has not been sufficient to cause the rupture of the joint.

Recently we have heard of several cases where operators, in order to increase the strength of casing joints to meet particularly severe conditions, have welded the couplings to the pipe at several points on each end of the coupling. To determine what advantage might be obtained from this practice, six samples of 8¼ inch—32 pound D. B.X. casing were made up into 12 foot sections with a coupling connection at the center. Each end of each coupling was then welded to the pipe at four points. From the same length of casing that each section was cut, another sample was similarly made up with a coupling, but not welded. These specimens amounting to 12 in all were then pulled to destruction in our large 600-ton machine with results as follows:

Tests on 8¼-inch—36 pounds D.B.X. Lap Weld Casing

Loads which joints withstood not welded Load in Tons		Loads which joints withstood when welded at 4 points in the circumference of couplings	
148		165	
158	Ave. 6 pcs.	179	Ave. 6 pcs.
147	151.83 tons	160	167.16 tons
157		164	
153		165	
148		170	

It will be noted that welding increased the strength of the joints about 10 per cent.

We wish to say a few words regarding the advantages of the upset in tubing. It has been the practice to recommend upset tubing for all strings 3000 feet or longer, but aside from the mere strength to resist pulling apart, this material has many advantages, all of which are probably not generally recognized.

In upset tubing the end of the pipe is made sufficiently heavy that the joint is the stiffest part of the pipe so that the bends are forced into the body of the pipe. The added thickness gives additional wearing metal at the joint and also offers additional resistance to the crushing action of the coupling—a very important consideration in a product which must be made up and broken as often as is tubing. Probably we need only mention that the upset will overcome any difficulties that may be experienced from tubing breaking off in the threads.

Seamless Interior Upset Drill Pipe

PROBABLY no other material used in drilling is subjected to as hard service as is seamless interior upset drill pipe. The advice given for the making up of casing joints applies with equal force to the making up of joints on seamless interior upset drill pipe. Regardless of the kind of grease used for lubricating the box and pin ends of the tool joints, zinc dust grease should be used for all pipe threads, including those that are screwed into tool joints. The last four turns in tightening the joints should not be made at greater speeds than 12 revolutions per minute for 6⅝-inch O.D. A.P.I. seamless interior upset drill pipe and not greater than 17 revolutions per minute for the 4½-inch O.D. size.

The joints should be made up tight before the material is run in the hole. The practice of allowing the pipe to make up as the string revolves in drilling carries sand and other grit into the joint and is one of the most potent causes of galling.

Care should be used to see that the tool joints have the correct form of thread and that they are tapped to a size which will permit their being screwed up by power until all full threads on the pipe are engaged by the threads of the tool joint. Confusion for the operator sometimes results from a difference in the depth of recess found in the product of various tool joint makers.

The depth of the straight portion of the recess of A.P.I. seamless interior upset drill pipe couplings is ⅛ inch. When these couplings are screwed on the pipe hand tight the face of the coupling should be 9/16 inch from the last scratch of thread on the pipe. A tool joint with the straight portion of recess greater than ⅛ inch should obviously screw up farther by hand than the coupling. For example, a tool joint with a ¼ inch recess should screw up on a hand tight fit 1/16 inch past the last scratch of thread on the pipe.

Line Pipe

WE believe little need be said about the care of line pipe. The precautions regarding unloading and rough handling of course apply to this product as well as to casing. The threads on pipe and couplings should be thoroughly cleaned, inspected and redoped. Our observation has been that machines for screwing up line joints are usually operated too fast. The final four or five turns in tightening, as with casing, should not exceed a circumferential speed of 20 feet per minute.

Corrosion

NATURALLY the matter of the protection of pipe against corrosion is one of the biggest problems entering into the care and use of pipe in the field. To deal adequately with this subject would require a paper in itself, and we shall not attempt to discuss any of the theories of corrosion. We might, however, say something about the care of pipe in storage yards. Material stored for any length of time naturally takes on a coating of rust. A very good preventative is a spray coating made of one-third linseed oil and two-thirds naphtha. This may be applied with a sprinkling can, a spraying machine, or a brush. Zinc dust grease affords very good protection for the pipe threads. It will stand the hot sun of summer and will not dry up and harden on the threads in any season.

In conclusion we would like to say that—

1. The American Petroleum Institute through its pipe standardization committee, and the bureau of standardization has provided for an improved quality of tubular goods.

2. The manufacturers are making every effort to furnish you with material fully up to the standard established by your Institute.

We hope that you are impressed with the fact that the successful use of pipe does not depend alone upon the manufacturer, and we ask that you co-operate with us by adopting uniform methods of handling the materials in the field so that the full advantages of this improved product may not be lost to you, the user.

Fire Prevention in Petroleum Stations

By F. C. Singleton
Safety Director, Standard Oil Co. of Indiana
Read Before Group Session on Fire Prevention, A. P. I. Annual Meeting, Tulsa, Dec. 9

DESPITE the tremendous growth in the past quarter of a century in the petroleum industry, a very careful survey of tank fires during the period from 1915 to 1925, recently published by the American Petroleum Institute, presents a truly remarkable record. Certain things in this report of the Institute are impressive, particularly the excellent record indicating that the number of fires in above ground oil storage tanks is astonishingly small, and that fire spread and consequent damage to adjoining property, where reasonable precautions are observed, are practically negligible.

Not many years ago there was no systematic design in laying out petroleum properties, and no systematic inspection of existing situations to uncover possible fire hazards. There was very little realization of the necessary safeguards required. Materials chosen for construction purposes were often unsuitable; indeed flammable materials were common. It is worth while, therefore, to give you some idea regarding the factors which we feel have contributed most prominently to the present safe handling and storing of petroleum products and which will summarize the practice of the company with which the speaker is affiliated, and are typical of what we consider good practice for the marketing end of the petroleum industry.

Seven Essentials

FIRE prevention and protection to petroleum properties has but seven essentials, viz:

1. Selection of sites which involve such accident hazards as proximity of flammable buildings, railroad yards, flammable stored materials, and character of neighborhood.

2. Planning and construction, which includes a clear conception of the use or occupancy of the property so as to obtain a safe layout with provision for future expansion, adequate strength for all structures and equipment and the specification of suitable materials.

3. Maintenance of structures and equipment, including systematic inspection to see that they are in a safe and fit condition for the service for which they are used.

4. Care in all operations where flammable materials are handled.

5. Good Housekeeping, or the maintenance of the entire plant in a neat, clean and orderly condition.

6. The installation of adequate fire fighting facilities.

7. A well organized and drilled force for combating fire so as to control them in their incipiency, before they can assume serious proportions.

Your attention is called to the fact that items 1, 2, 3, 4 and 5 are essentially preventive, while 6 and 7 are protective measures.

Care Big Subject

IN TAKING into consideration the first five of these seven essentials, viz; Selection of Sites, Planning and Construction, Maintenance of Structures, Care in all operations and good housekeeping, oil storage will be reviewed from the producing fields to the ultimate consumer. This, of course, is a very big subject and alone requires considerable time and paper to explain the many hundreds of operations from the time the crude oil is taken from the ground, stored into tank farms, run through thousands and thousands of miles of pipe lines or tank cars to the refineries, then to the thousands and thousands of bulk distributing stations and finally by way of the service stations or tank wagons to the ultimate consumer.

In many of the older installations both in the producing and marketing fields, tanks were spaced so close, shell to shell, that the spread of fire from one tank to the other was much more likely, thereby making it possible, in some cases, for the fire to spread to an enormous area before it was possible to get fire fighting facilities into play. Tankage as laid out today will be found to be spaced systematically, with reasonable distances between shells, allowing where necessary, for fire banks and permitting the efficient use of fire fighting facilities. This does not apply, however, to service stations.

Wood roofs on tanks were, in the early days, almost universal. From wooden roofs the industry went to steel roofs, with a resultant decrease in the fire risks. Today, vapor-tight steel tanks for the more highly volatile oils is considered standard practice. Statistics show this type of tankage to be the safest yet devised.

Proper roof accessories, especially those approved by the underwriters, are also a big factor in making storage safe. Large vents or latchways should be screened, manhole openings should be kept tight when not in use, gauge holes should be properly closed when not in use and no other openings allowed which might permit the propagation of flames.

Other types of protective devices designed to protect the tanks against lightning, static and stray electrical current is also considered good practice, but it is doubtful whether many companies can furnish authentic data on these devices due to their not being in use for a sufficient length of time. However, our company has gone to considerable expense in protecting its properties against the possibility of fire due to these causes, viz., lightning, static and stray electrical current by electrically connecting its tanks, pipes, pumps, side tracks and other machinery thereby equalizing the electrical potential throughout the entire plant.

Today, it is practically impossible for any of the plants belonging to the Indiana company to catch fire from these causes, especially static. These devices though considered good practice, are not necessary for all bulk installations and no laws should be enacted compelling oil companies to install them unless absolutely necessary.

The design of the shell of the tank itself is receiving much greater consideration than formerly. Tanks are now designed carefully with regard to the strength of joints, using suitable materials and a reasonable factor of safety throughout.

There has been some discussion regarding the safety attainable from a fire hazard standpoint by the installation of underground oil storage tanks, particularly at bulk distributing stations. Some municipalities have enacted ordinances prohibiting the construction of steel gas-tight horizontal or vertical above-ground storage of considerable size and have required the industry to install underground tankage in an effort to minimize the apparent fire hazard.

Large under-ground tanks considered as containers for the storage of petroleum products have many disadvantages. Among these may be mentioned the materially increased cost of installation, the fact that repairs are difficult and often impossible to make, the liability of serious leakage which would not be detected as quickly as if the containers were above ground, the fact that topographical and soil conditions often preclude entirely such installations.

Fire Banks

IN THE early days of the industry, fire banks were very rare and little attention was given to their proper design, construction or maintenance. Fire banks are, in some cases, an important feature, and in general serve only one purpose; to take care of boil-overs from

burning tanks and to hold the contents of the container in case of ruptures of the tank. The latter being hardly probable due to present day construction, except, in case of fire where no fire fighting appliances are used. Regarding the use of fire banks for tankage containing products which do not present the boil-over hazard, such as ordinary gasoline and kerosene stocks, it is not feasible to make a ruling which would cover all conditions. The governing factors should be: location of the tankage with respect to adjacent combustible construction, the topography, the nature and specification of the products stored, the type of fire extinguishing equipment available in case of fires, etc.

A bulk distributing station of today, designed along modern lines, is systematically planned, with zoning of the various units to provide for the different operations and providing proper avenues of approach. Plant construction in general is built today of fire-resisting materials.

Equipment motors, pumps, boilers and other machinery entering into the construction of a modern plant are generally very carefully selected with regard to their suitability for the service. Other agencies in plant construction from a fire protection standpoint, such as water and foam systems are located where most available for use in an emergency. Valves, pipes and tanks are arranged to permit easy accessibility.

Check valves, installed inside the storage tanks at the point where the pipe lines are attached will close automatically in case the pipe lines are broken during a fire. Safety valves of proper size are provided which will open and thus relieve interior pressure in case of boiling of the contents of the tank. Tanks are erected above ground usually on eight-foot concrete piers and spaced sufficiently far to permit proper circulation of air, etc.

Fireproof Filling Stations

SERVICE stations while they are not to be classed with transportation nor storage plants, yet, they are essentially a part of the oil industry. The larger companies have invested large sums of money in land, and have constructed modern fire-proof buildings to be used for the purposes of marketing their products. These are in reality nothing more than retail stores and serve as one of the mediums whereby the products of the oil companies are sold to the consumers. These service stations are modern in every respect.

They conform to the various codes of building, lighting, heating, ventilation, etc., and have all the facilities to be found in any of your more modern buildings throughout your cities. Every precaution is taken to safeguard the lives of its neighbors, its patrons and its employees against the possibility of injury from fire. The average service station of today is a credit to any locality.

The third essential—Maintenance, is considered a big factor in reducing fire hazards.

Where insurance is carried, many of the larger insurance companies are organized to make inspections and carry on the maintenance work. In the company with which the speaker is affiliated this work is done by each division office within the company itself over which the divisional manager has absolute jurisdiction. The division safety and construction departments are charged with the responsibility of seeing that unsafe conditions that occur due to natural depreciation and operation are corrected. This covers maintenance of electrical equipment, pumps, stairways, painting tanks, and pipe lines, etc.

Monthly Fire Inspection

EACH 30 days a fire inspection report is turned in to the divisional office by authorized persons in the division whose duties require their inspecting the various plants, buildings, equipment, machinery and fire fighting facilities in the territory under their supervision. These inspectors have authority to make such changes as in their judgment will reduce fire hazards.

Copies of these reports are kept on file in each division office where they are available if desired by local fire chiefs and state inspectors who frequently visit our properties. The original copies of these reports are carefully checked and filed by the general office Safety Department.

Our fourth essential—Proper care in all operations where flammable materials are handled whether it be tank farm, refinery, bulk storage, service station or tank wagon deliveries, depends naturally on the personnel.

The hazards due to this cause in our company are taken care of:

1. By the selection of careful men to have charge of operation.

2. By supplying well designed buildings, tanks, pumps and transportation facilities.

3. By providing fire fighting equipment.

4. By proper instruction and supervision of the workmen in safe methods of handling our products. This factor is considered as perhaps the greatest in preventing fires around oil storage.

Rules covering the storage, transporting and sale of petroleum products are issued and no infractions permitted, such as the short-cut methods, etc. Any violation of the rules, as laid down by the company, results in suitable discipline and continued failure means the discharge of the offender regardless of his length of service or sales ability. Safety of the remainder of the personnel as well as that of the plant and surrounding properties must be maintained.

Good Housekeeping Important

THE fifth essential—Good housekeeping—can be mentioned briefly, but its importance is never minimized as it is a very necessary item in fire prevention.

Earlier in the paper good housekeeping was defined as "The maintenance of the entire plant in a neat, clean and orderly condition." By appealing to the pride of the plant manager, with a consequent high morale of his operating force, is one way which we attain this result.

The last two of the seven essentials, namely—the installation of adequate fire fighting facilities and a well organized fire fighting force deal with fire protection. It is conceded that in certain divisions of the oil industry special forms of fire fighting facilities are advisable. Therefore, the sixth point deals in a general way with all types of fire fighting appliances found in oil plants. These are divided into several classes: high pressure water; steam smothering lines; foam systems; sand; sawdust and soda, and the various hand and portable extinguishing equipment.

While there are a number of bulk distributing and service stations amply equipped with fire fighting facilities these stations should be studied with relation to adjoining hazards, and amount of protection afforded by the municipality before any fixed rule can be followed regarding the kind, size and quantity of extinguishment needed on the plant property. There is, of course, an economic limit which should not be exceeded in providing fire protection facilities for these stations, and it is felt that a most careful study should be made of the adjoining hazards; hazards outside the jurisdiction of the particular oil company, with a view to the reduction of these hazards, before recommending any extensive fire protection system in its bulk distributing or service stations, as otherwise the investments of the oil companies may become so burdensome as to be necessarily reflected in prices of their products.

The seventh and last essential is organization for combating fires. This is a matter which must be given individual study by the particular oil company and the unit organized to fit each individual plant, or service station.

In each of the larger plants of the Standard Oil Co. of Indiana, there is such an organization comprised entirely of the regular employees. This force is under the direct supervision of the plant manager and is subject to periodical fire drills. The utmost promptness in applying whatever fire fighting facilities are available, and as you know this constitutes the most important element. Hence an effective organization is just as necessary as adequate equipment. Without it the equipment, no matter how elaborate, is practically useless. Other duties of this organization require the closing of all valves, shutting off all machinery, closing all doors, windows and the extinguishment of the fire.

In conclusion, it is believed that the foregoing specifies concisely the out-

standing features which should be considered from both a fire prevention and protection standpoint in selecting, planning, designing, building, maintaining and operating petroleum properties. Adherence to even a few of the fundamental principles should give considerable protection. In cases where special hazards exist, other construction may be necessary to minimize fire risks.

It is with pardonable pride that we point to our progress thus far made in the matter of fire protection for during the year 1924 less than 1 per cent of all our property damage accidents was the result of fires. The majority of these were to motor cars which were stored inside public garages.

Some Manufacturing Problems of Refiners

By W. S. Zehrung
The Pennzoil Co., Oil City, Pa.

Read Before Group Session on Petroleum Refining and Its Problems, A. P. I. Annual Meeting, Tulsa, Dec. 8

THE subject of this paper is exceedingly trite. Manufacturing problems are being discussed everywhere, and for this reason it is very easy to name one of half a hundred problems, and develop it indefinitely, with the result that, regardless of the treatment accorded the problem, argument will be provoked. It will be the purpose of this paper to attempt to show that the fundamental problems are few in number, and that they are generally overshadowed by problems of detail.

It is axiomatic to say that the principal and only real problem of refiners, or any other business, is to make a profit—not to show it, but to make it. The first point under this problem is the question of personnel.

Many refiners neglect this question or pass it by as solved, but there are many large refineries whose tremendous salary overhead appears to be eating into profits, and many small ones who are probably wasting money or supplies through the lack of suitable men. The problem for the refinery executive is to select the best men available for the work under his jurisdiction, insofar as he has salary funds available, to instruct these men in their duties, and then to direct and coordinate their work to the end that the refinery operation shows a satisfactory profit.

If the refiner does not get across the idea to all his employees that the cost of their individual labor must be met by profits to be derived from the results of their labor, his daily problem will be to hunt for weak spots in his organization, to do the work left undone, or hire more men to do it.

In any case, the effort will be at the expense of that particular executive's personal efficiency. It is obvious that if every man did exactly what was expected of him and a little more—a Utopian condition, of course—the problems of the refiner would be entirely connected with the physical operation. It seems increasingly hard to find men who understand this condition.

Cost Accounting Pays

IN this connection, if a refinery has a man or an office force dedicated solely to getting accurate costs, not only of labor and materials, but of equipment lost time, the work can easily pay its way through increased production. Each foreman can be furnished with a cost account of the work under his direction, and he can then be held responsible for lack of improvement.

Under such a system, if the responsibility is properly allocated, if the men are responsible to their immediate superior only, and if there is no "going over the boss's head," the operation should be peaceful at least, and should be efficient. Many refiners have a system of this order, but it is surprising how many have not, in view of the benefits to be derived in increased production, and low labor turnover.

A second factor in the production of the profits is the differentiation between efficiency and economy. This is necessary to the ultimate solution of any refinery problem. It is fairly easy, given a large expense allowance, to obtain high efficiency out of most machines used in oil refineries, but in view of the original premise that profits are to be desired, the problem arises—is it economical to do so? Take the case of the steam plant.

In central power stations it is common practise to run well over 90 per cent over-all efficiency. The same methods, and the same equipment can be employed in any refinery to achieve the same efficiency. In the very largest refineries, or at least in those where the steam and electrical demands are greatest, the management can afford to use central station equipment, and to employ a force of men whose sole duty is to see that the greatest efficiency is obtained. Here it is possible to have both high efficiency and economy. In the smaller plants, depending on their size, it is economical to run at lower ratings, and cut down the supervising overhead, and maintenance charges which would arise without proper supervision. The operation is at lower efficiency, but the cost accounting will show a greater over-all economy per power unit.

Efficiency Balanced with Economy

THIS should not be construed to mean that efficiency should be sacrificed, but that the happy medium should be sought in all departments—the proper efficiency will show the greatest economy.

Under the heading "Contents" in the October issue of *"Chemical and Metallurgical Engineering,"* the following sub-heads appear:

Materials for Extreme Conditions in the Industries.

High Pressures and Temperatures.

Reducing the Labor Required for Handling.

Explosion Hazards.

Problems in Handling Finished Goods.

Corrosion.

Eliminating Manual Handling in Continuous Manufacture.

Erosion.

Unusual Plant Conditions.

There is not one of these headings which does not bring to mind a manufacturing problem of the refinery operator. Yet they were written to apply to all the chemical industries. But in spite of such an outline, and in spite of the tabulations and discussions of the various commentators on the different phases of refining, one problem still attracts the attention of refiners more than any other.

This problem is heat economy. The refining of crude petroleum consists essentially in the heating and cooling of oil an indefinite number of times, and during this period in applying such processing as will serve to produce the desired oils. Not very long ago practically all the heat was wasted. Today the advancement of the art is rapid and encouraging.

New Types of Equipment

THE pipe still and fractionating towers are replacing the tank still and rerunning even in the oldest and most conservative refineries. The interest of the refiner is directed to better heat conservation through vapor heat exchangers, residuum heat exchangers and partial condensers acting as heat exchangers. In many cases the ideas and designs have been lifted bodily from another industry. The problem here is to make an apparatus for running oil. Many heat exchangers or apparatus for a similar purpose have been applied without proper regard to the amount and quality of the heat available.

Sometimes the refiner contemplates the installation of such equipment, and

when he gets it installed he finds that he is a year behind the other fellow. The problem is almost one of omniscience. The national petroleum organizations through their group meetings and the trade papers through their reporting such meetings are helping to solve this problem through the exchange of ideas, but in spite of this help the refiner must make his own application.

For example: If one refining company is using a once-through pipe still and a single tower to run its crude, and another refining company is using a conventional tank still battery for the same purpose, neither installation may be a criterion for a third organization which may have entirely different ideas regarding the running of oil and whose market may be for different products. There have been cases in the last few years where refineries have put in equipment because their neighbors did, and in some of the cases the equipment has not been used yet.

There are many other problems which could be discussed at length. The problem which covers the design and operation of gas recovery plants is receiving more attention in the older, eastern refineries since these older recovery plants in some cases are proving too expensive to operate. The cracking problem is with nearly every one. Filtration is offering numerous problems to complete refineries. Fire prevention is always before the refiner. Corrosion and its attendant losses offers a tremendous problem.

It would seem that discussion of these problems should be taken up in separate papers devoted to one phase of one problem only.

This paper has been intended to show that if the problems of coordinating personnel, of distinguishing between efficiency and economy as applied to new developments, and the fundamental problem of heat economy are attacked by each refiner as befits his needs, that the main problem of the refiner—that of making a profit—will be simplified. It never can be eliminated.

Present Oil Well Cementing Practice

By R. L. Wright
Gypsy Oil Co., Tulsa

Read Before A. P. I. Annual Meeting, Tulsa, Dec. 7, 8 and 9

COMPARED to cement used on the surface of the ground that used underground has much more difficult conditions under which to set and requires a longer time to set properly. In the past the industry has expected too much from cement. If you were constructing a paving job you would be required to let that cement set for 28 days before it could be used, yet some operators have cemented a well one day and then wanted to go back into it the next.

No doubt many jobs that would have been successful have been spoiled by going back into the well too soon. There are a good many operators who believe that salt water prevents cement from setting. Right here we wish to say that in our experience we have never seen a water encountered in an oil well that cement would not set under.

The mixing water, however, for the cement should be fresh. A water that is extremely salty or muddy should not be used. Although it will not spoil the cement it will make the finished product only from 50 to 85 per cent as strong as the same cement would have been if it were mixed with fresh water.

Cement Accelerators

THERE are several cement accelerators on the market sold under different trade names—most of these are in liquid form. Also there is a chemical salt, calcium chloride, which will accelerate the setting of Portland cement. This is a solid, but is soluble in water and should be dissolved in it and added to the cement in the mixing water. In fact, all these accelerators should be added to the mixing water.

To those of you who are interested in accelerating cement, we will refer you to Bulletin No. 13 published by the Portland Cement Association and the Lewis Institute of Chicago, entitled "Calcium Chloride as an Admixture in Concrete." Briefly this bulletin states that Calcium Chloride is a good acceleration for Portland cement and that 4 pounds of it per sack of cement is about the maximum that should be used. In some present oil field practice 1 to 4 pounds of calcium chloride is being used successfully.

There are special cements on the market—Luminite is one of these. It has a different composition than Portland cement, being higher in iron and alumina and lower in silica calcium and sulfur. It is a quick hardening but not a quick setting cement. It will remain as a plastic mud for a period of from 8 to 14 hours before it begins to harden and then will gain strength very fast so that by 24 hours it will be harder than Portland cement will be in 30 days.

This is in contrast with Portland cement which begins to set within a half hour after it is mixed. Lumnite has its special uses and has proven very satisfactory in them. Accelerators should never be used with it nor should it be mixed with Portland cement. Also there are special Portland cements. These are finer ground than ordinary Portland and require a little more water in mixing and set up a little faster.

Underground Uses

CEMENT is used underground for different purposes, viz:—to cement a string of casing; to repair a leak in the casing; to fill a cave; to plug back a sand or to shut off water behind a liner. These will be taken up briefly in this order.

Practically all casing that is cemented is done by the Perkins process using 1 or 2 plugs and the Halliburton mixer. However, a great deal of surface pipe in rotary work is cemented by mixing the cement by hand in a box and then dumping it into the casing. In cementing a string of casing speed is the big factor. It is not necessary to have a shoulder to set pipe on as over 2,000 strings have been successfully cemented with the pipe hung from the surface. Cement begins to hydrate or set up as soon as water is added to it, thus it is essential to get it down and on the outside of the pipe as soon as possible. In order to do this there are a few precautions to be taken.

The first and main one is to have plenty of water available—the second one is to have plenty of men to handle the cement—third—is to have your hole clean so that circulating pressure is as low as possible—this increases your chances of getting all the desired cement out of the pipe. Regarding this Perkins process there have been other methods advocated, such as gauge pressure, reflecting the time at which the cement is going out of the pipe and the distance the cement has risen on the outside of the pipe, and also by measuring the water which is put in after the cement is in the pipe, knowing how far this volume of fluid will fill in the size of casing being cemented and by this method determining the position of the cement in the pipe.

Some Disadvantages

THESE other methods in some cases have particular disadvantages—for instance in rotary drilling where a gas sand is encountered, and it is desired to set pipe there is a possibility that the rotary mud would contain some gas or oil, the oil might emulsify to cause the the same effect as the gas, that of allowing the liquid to compress which

would throw the calculations off on the volume. Also these methods would increase the possibility of cement channeling down the pipe, which would also throw off the calculations.

At any rate we do not believe it is as satisfactory or as accurate as following a top plug with a steel line measuring device. A new steel line measuring device is now in use that is accurate to within 6 inches in 5000 feet. The mixer used has a large capacity which makes for speed, and at the point where the water and cement come together there is a partial vacuum. This is a good feature because it eliminates a part of the air which would ordinarily be trapped in the cement. The elimination of this air increases the speed of setting by allowing the water to penetrate further into each little particle of cement.

The amounts of water required to mix the cement can be figured for each job on the basis that 1 barrel of water will mix 7 sacks of cement. To pump the plugs down the water required can be figured on the basis of the water required to fill the different size casing 100 feet. It will be slightly different for different weight pipe. but roughly for 5⅜ inches it will be 2¼ barrels; for 6⅝ inches 4 barrels; for 8¼ inches—6 barrels; for 10 inch—9½ bbls.; for 12½ inches—15 bbls. Where it is in a rotary hole the mud fluid is used to pump the cement down, but in a cable tool hole this water must be available in a short period of time. In order to play safe an ample supply of water should be provided before the cement job is started. A 10x4½x10 pump is generally used to pump the cement down, and it will handle up to 175 bbls. per hour. If this water is not available, and it is necessary to shut down until you get more water the cement all the time is setting up and the job will probably be spoiled if you have to wait over half an hour.

Piling the Cement

IN getting ready to cement, the cement should be piled on end and the sacks opened, if they are cloth sacks—if they are the new paper sacks, it is best to pile them flat in rows extending away from the hopper. Then as the cement is being placed in the hopper, have one man with a knife split the sacks across the middle—this plan has worked very successfully in practice.

In a rotary hole where the pipe is floated in with a float collar a special first or guide plug is used which allows the cement to pass it when it hits the float valve.

As soon as all the cement is mixed and in the pipe the hose connection should be broken, the swedge disconnected and the top plug put in. This should be done before the mixer and cement pumps are washed. The hose can be thrown over into the slush pit to wash these, if it is desired, but you should try to keep away from having nothing but water underneath the top plug. The cement will tend to settle a little allowing nothing but water to be underneath the plug, which is the reason that the top plug should be stopped up in the pipe at least 40 feet as a minimum and 75 feet would be better. Drilling 75 feet if the plug is stopped that high does not amount to anything compared to the increase in the chance of making a job, as the cement immediately underneath the plug has settled a little bit so that there is an excess of water which makes the cement very soft and is easily drilled.

When the cement is going past a water strata on the outside of the pipe on the way back up the hole the excess mixing water will leave it as it is under pressure from the column of water, cement or mud fluid above it. The cement, however, will not penetrate the sand, but will form a thin coating or film on the wall. Cement can be forced back into fissures or cracks but it cannot be forced into a water, gas or oil sand unless it is very broken or very loosely cemented. The elimination of this excess mixing water is the reason why such a very large percentage of cement jobs are a success because it is a well established fact that the quantity of water used determines the strength of the finished product.

Amount of Water Excessive

THE amount of water used in this process is excessive and if it were not eliminated when it gets behind the pipe the cement would take longer to set up than it does. This excess water must necessarily be used to make a fluid that can be handled by the pumps.

In a cable tool hole where circulation cannot be secured due to the water going back into a barren formation the casing should not be filled entirely with water to force the plug down, as it would force the cement too far. The Texas Panhandle has this problem. On a job of this nature the cement will gravity to the bottom of the casing—a top plug should be run and followed with a steel line adding just enough water to get the plug down to the desired place. The amount one sack of cement will fill in feet outside of different size casing in different size holes is as follows:

	Inches				
	6⅝ in.	8¼ in.	10 in.	10½ in.	11¾ in.
5-3/16	20	5.7	2.7		
6⅝		13.5	3.6		
8¼			3.3	2.8	2

To repair a leak in the casing bridge the pipe between the shoe and where you figure the leak is—this leak can be determined by running a casing tester—allow at least 10 feet between the top of the bridge and the hole—this is to take care of the space required by two plugs. Then pump a test plug followed with a steel line, this plug will go to just below the leak and then stop, then put in your cement and pump the top plug down to within 50 feet of where the test plug went, allow the cement to set and then drill out that in the pipe.

Fighting A Cave

CEMENT can be used very successfully in fighting a cave in either a cable tool or rotary hole. Here it should be run through tubing. The procedure is to wash the tubing to bottom or below where the cave is, then put in the cement. While the cement is going in, the tubing should be kept moving at least a full length of a joint. The idea of this is to pass the collars in the cement as this cuts down the chance of sticking the tubing. The reason for running the tubing below the cave is to float the mud out on top of the cement. If the cement were just dumped in on top of the cavings, it would not float them out as there is not enough difference in weight; also the viscosity of the mud and of the cement would prevent the cement from going to the bottom.

Cement can also be used to plug back a well that was drilled into water or to plug off bottom water. In a hard formation a limit plug or lead wool is very satisfactory but in soft sand cement is better because it is a liquid that completely occupies the cavity and will bond to the sand. In driving a limit plug or lead wool the sand will break away as the plug or wool is driven up against it—also they do not adhere or make a bond to the sand. Be sure the hole is clear of cavings and iron and the total depth checks.

The well should be prepared for cementing by letting it stand till the water reaches its own level. To save time this water may be added, then dump your cement with a dump bailer, and add 20 to 30 barrels of water. In a well that is making water, even though the fluid level is constant, there may be motion of the water at the bottom of the sand from the lower water strata up to the upper part of the sand and back into the sand at this point. This motion caused by a migration of the water would keep the cement from setting properly. The idea of putting this water in is to put additional weight or pressure on the cement and over-balance the water pressure of the water strata.

This additional pressure will force some of the excess water out of the cement allowing it to set up faster. It also will supply the water the upper part of the sand is absorbing for a long enough period of time to allow the cement to set up without being disturbed by the migration of the water from the lower water strata.

Hard to Figure Quantity of Water

TO determine the amount of cement to use is the hardest part of this job because there is no way of predetermining from the surface the highest

point in the sand where the water is coming into the well. If the well has not been shot one sack of cement should fill in different size holes the following number of feet: 5 inch tools 8 to 8½ feet; 6 inch tools 4½ to 5 feet; 8 inch tools 3 to 3½ feet. If the well has been shot there is no telling how far one sack will fill. In practice it has ranged from one sack filling 5 feet to 25 sacks filling one foot. Most of the wells that have gone to making water are old and it would be quite an expense to put in a rig front if it were a power well and move in tools to drill the cement out if too much were put in, so the way the work should be done is to put in a little and test it out and add more until a job is secured.

There also must be little breaks in the sand to make the job a success. If these are not present in a short time the water will bypass the cement plug and come into the well as before though probably in lesser quantity. The well should be gauged accurately before and after each job to determine the results —good records should be kept on each well.

In some places where the casing is not set on top of the sand and a liner is used and water is coming in behind the liner, it can be pulled and perforated then rerun with a cast iron plug in the shoe and cement dumped with dump bailer until it is filled. Water should be added all the time cement is being placed. The reason for doing this is to keep putting additional pressure on the cement to force it out through the perforations up against the sand and force the excess water out of the cement into the sand.

After it has set up drill out the cement in the liner and the cast iron plug. Some of the old wells in the Burbank field offer this problem. A job of this nature is a good place to use Luminite cement. The fact that this cement does not take an initial set before 8 to 14 hours gives plenty of time to run all the cement with the dump bailer. Three wells were treated successfully here by this method.

Give at Least Three Days

WE have not suggested as yet any time limit as to how long cement should be allowed to set before work is continued on the well. Let it set as long as you can conveniently—the longer the better, as cement is continually getting harder for a period of years. However, we recommend at least three days whether you use an accelerator or not. The best cement on earth won't set if it is kept disturbed, so get it down and in position as soon as you can and then keep it from being disturbed. When a cement job goes bad 99 times out of a 100 something else is wrong other than the cement not being good.

In this paper we wish to acknowledge the help of the Halliburton Oil Well Cementing Co., the published articles of the Portland Cement Association and the Lewis Institute and the suggestions and opinions offered by many individuals.

The Motor Fuel of Tomorrow

By T. A. Boyd
General Motors Research Corp., Detroit

Read Before Group Session on Motor Fuel, A. P. I. Annual Meeting, Tulsa, Dec. 8

ADEQUATE discussion of the topic assigned to this paper, "The Motor Fuel of Tomorrow," would appear to involve touching upon two things. The first of these is that mentioned above, the *prospect* of our being able to secure fuel for the automobiles of the future. The second phase of the subject relates to the probable *characteristics* or *properties* of the motor fuel of tomorrow.

Will Gasoline Last?

THE prospect of motor fuel for the future is a subject that has been discussed by many people of late; and, in the light of knowledge available at present, rather exhaustively, it would seem. There are three schools of prophets in this field: first, those who say that there is plenty of fuel in sight for the future; second, those who are optimistically doubtful, but who hope for the best; third, those who say that the motor car is definitely headed for a dead stop, because soon there will be no more fuel for it.

Almost everyone, perhaps, will agree with A. C. Fieldner in his statement that "the present flood of petroleum is a temporary episode in the world's history." But people will differ widely in their interpretation of that not very specific adjective of his, "temporary." And, indeed, the best evidence that it has been possible to unearth so far as not adequate enough to permit any qualifying adjective that is at all specific to be put into such a statement.

Still, we do know definitely that immense amounts of petroleum are being consumed all the time, and that the data we have available today do not justify the assumption that our supply of oil is inexhaustible. As Fieldner and Brown have pointed out with reference to the estimate of our reserve of liquid fuel, and potential liquid fuel, made recently by the Committee of Eleven, only a little over four per cent of it is petroleum. And here we have already reached the stage where one-half of our developed horsepower is in the form of gasoline engines, which are altogether dependent upon petroleum for their operation, and upon only a portion of petroleum, at that.

Certainly it is a common sense conclusion that, in the face of such a situation, we ought in every possible way to conserve what we know we have. By conservation we do not mean hoarding, but only wise and economical use. Whatever the possibilities of other fuel sources may be, and it is recognized that they are very large in magnitude, it would seem to be apparent that "A bird in the hand is worth two in the bush."

We should not fail to make acknowledgement here that there is a great deal of interest now in the matter of conserving petroleum, and that a commendable amount of effort and research are being concentrated toward that end. In the main this is being directed along four lines as follows:

1. In increasing the production of petroleum by the use of more scientific methods and by improving the recovery from the sands through flooding and the use of compressed air or gas.

2. Improving refinery practice to give a higher recovery of motor fuel and to reduce losses.

3. Improving cracking processes and extending their application.

4. Modifying the constitution of gasoline and treating it chemically to make possible its use in more efficient engines.

Industry Should Investigate Supplementary Sources of Energy

WITH regard to the superior value of a "bird in the hand" over one in the "bush," it may be said further that, unless the marksmanship of the hunter is good, even that old proverb is not strictly true, for a poor aim could easily make the ratio one to five instead of one to two. And this brings us to another one of the points that should be made in this paper, namely, that in addition to all that is being done to utilize petroleum more efficiently, it is important for American industry to support some comprehensive research in the field of possible substitutes for th products of petroleum. These possibilities have often been enumerated as follows:

1. The fermentation of vegetable products.

2. The distillation of oil shale.

3. The carbonization of coal and lignite.

4. The direct hydrogenation of coal.

5. The synthesis of alcohols and hydrocarbons out of gases produced from coal.

It is recognized that valuable research has already been conducted on every one of these possibilities, and that a small amount of it is going on today. So far as this country is concerned, these investigations have been made principally in the fields enumerated above. But, for the most part, the potential processes mentioned above are not at all commercial as yet, and a great deal of work remains to be done on each one of them before they can produce much of the immense volume of motor fuel that we must have for our automobiles. Just how much work must yet be done, no one can possibly say, but all experience indicates that in every case it is bound to be a large amount.

Will Take Time

NOW there is one peculiarity about research that makes it especially important that some work should be going on all the time toward the gradual development of these potential processes for making the motor fuel of the future. This is that any research project has to have time to grow up to the commercial stage gradually. It cannot usually be rushed through to perfection in one-half the time by doubling the force.

We sometimes hear people speak of hatching out an idea or a project. That is pretty much the way results must be arrived at, too. And time is a very essential factor in any hatching process.

Some years ago when Charles F. Kettering was in charge of experimental work for the National Cash Register Co., the head of the company, John H. Patterson, came to him one day to inquire how soon a certain development would be completed.

"In about a year," Mr. Kettering replied.

"All right, then, I want you to double your force and finish it up in six months."

"I am sorry, Mr. Patterson, but that cannot be done. It will take just about one year to finish the job."

"Do you mean to tell me, Ket, that you could not make twice as rapid progress on this project if you had double the men?"

"I will answer that question by asking you one, Mr. Patterson. Do you think that by putting more hens on the nest a setting of eggs could be hatched out in less time than three weeks?"

There are some things that cannot be hurried very much. Hatching eggs is one of these, and research is another.

Hatching Should Be Started

IT IS not possible now to tell for sure whether it will be three years or three decades before we will need to supplement our supply of petroleum with other liquids, but it is certainly a reasonable assumption that it is already time for industry to get a hen or two set on a few of these likely looking eggs. Some of them that we think are good may turn out to be bad in the end, you know.

In the estimated reserve of potential liquid fuel as made by the Committee of Eleven, 95 per cent of the total is represented by deposits of oil shale, coal, and lignite. As an attempt to count the eggs of energy, this estimate would appear to be an entirely conservative one. But, as has been said above, the best possible processes for converting these solids into liquids have not yet been worked out to a point where they are near enough to the commercial stage to be used at once if petroleum should begin to diminish.

Just as one concrete example of what is meant here, the matter of making automobile fuel from coal may be cited. Eighty per cent of the potential motor fuel estimated by the Committee of Eleven is represented by coal and lignite. But our present methods of carbonizing coal do not yield enough motor fuel per ton to justify the mining of coal for motor fuel alone. These processes of treating coal make the liquid obtained so small in amount as to be only a by-product, with coke the principal product. The demand for coal and coke is pretty definite, and not large enough to permit the production of more than a portion of our motor fuel requirements from coal, without making more coke than the market can absorb. And the strictly chemical processes of synthesis and hydrogenation, as typified by those of Fischer and Bergius, by which larger percentages of the coal are converted into liquids, are only in the early stages of development as yet.

On this basis, is not the situation, at least so far as coal as a source of motor fuel is concerned, uncertain enough to be a little like checking chickens against eggs, and would it not be worth while to get an experimental hen or two set on some of the eggs to hatch clear out into reality a trial setting or so of them?

Systematic Research Needed

THE natural suggestion from the above is for American industry either to conduct itself, or else to subsidize some qualified institution to do for it, definite and systematic research to carry all the way through to commercial completion the development of processes suitable for making motor fuel out of the known reserves of energy that we have. It is true that a small amount of such work in one or two of the fields is already being done here, and that a considerable amount of it along some lines is going on abroad. But, so far as the latter is concerned, experience with other things—dyes, for example—has shown that if technical processes are to be useful to us they have to be developed under our own domestic conditions, and men have to be slowly educated and trained in the technique involved. The thing suggested is for systematic and comprehensive research to be supported here toward developing the known sources of energy, to the end that an unfailing supply of motor fuel may be definitely assured.

The attention of anyone who wonders where the support for such work can come from is called to the fact that every year in this country we are spending more than $10,000,000,000 on motor cars. If only one-tenth of one per cent of this immense amount of money could be set aside to support scientific prospectors for the fuel of the future they would have $10,000,000 a year at their disposal. Think what all the American Petroleum Institute is planning to accomplish with the $100,000 a year derived from the research funds provided by Mr. Rockefeller and the Universal Oil Products Co., and then compare that with what they could do with 100 times as much.

As Henry L. Doherty has suggested, there has probably been a little more loose talk about what science can do to provide energy for the future than is fully justifiable. "The tendency of the day," Mr. Doherty says, "is to get away from the thought that improvement is apt to come only from long work, conscientiously done and intelligently planned." Certain it is that science can not serve society very well unless there is adequate support of its patient endeavors, and unless its investigators are given enough time to work out their ideas and to apply their discoveries.

There is a Wealth of Energy in the World

NOTHING that has been said above should be interpreted as indicating any pessimism whatever about the adequacy of the world's reserves of energy producing material. Nature has plenty of it stored up for us. The points we have been trying to make are simply these: (1) we do not yet know as well as we should just how to unlock the storehouses in which Nature keeps the wealth of energy that we know she has, and (2) we ought, in view of that fact, to back some of our best qualified searchers in looking for the keys.

One illustration may be given here in support of the faith that plenty of energy can always be found to run our motor cars, if only we will search for it in the right way. Without considering the immense stores of potential energy included in Table II, we know that the sun, which was the original source of all the store-up energy that we are drawing upon now, is still sending perfectly enormous amounts of energy to us. Nearly 1500 tons of coal would have to be burned up to produce as much heat as the sun focuses upon a single acre of ground in this latitude during the 90 days or so of summer. (If you would rather have that value in gasoline, it is about 300,000 gallons.)

The critic will point out, of course, that we know no way that is at all

efficient for getting the energy of the sun into a form that we can use to operate an automobile. Natural vegetation is so inefficient, he will say, that, in return for all the immense amount of sunshine showered upon it, an acre of ground yields a crop of corn or wheat or hay that is equivalent to much less than five tons of coal. Hence the efficiency of vegetation, which is the best converter of sunshine that we have now, is less than one-third of one per cent.

Lots of Sunshine

ALL of this is perfectly true. It is to be hoped, of course, that future research will find a way to utilize sunshine which will be much more efficient than vegetation. But, even if such a thing should not be found, we know that the storehouse of sunshine upon which we have to draw is so inexhaustible that an extremely low efficiency in recovering its energy would not mean that the sun could not be depended upon as the source of our future requirements for automotive power.

It has been said that the land required to produce crops for making motor fuel could not possibly be spared for that purpose, because it is needed to raise food for humans. But it may be pointed out that in 1917 we were supporting about 25,000,000 horses in this country. That is five million more horses than we now have automobiles. Does it not seem reasonable that a horse should use up as much energy as the average motor car? It is a fact that he does, too. In a year a horse eats from 6 to 7½ tons of feed, and that is the product of about five acres of ground. There is an old English proverb that says, "Money makes the mare go;" and evidently it takes a great deal of it to keep her going. Even on the basis of present knowledge, the alcohol equivalent of the vegetation produced on five acres is in the neighborhood of 500 gallons. (Note that the average annual gasoline consumption per car is just about 500 gallons, too.) This means that the crops eaten up by the horses we have been supporting have an alcohol equivalent of around 12,000,000,000 gallons, which is considerably more than the immense volume of gasoline that will be used up this year.

Mindful of the fate of prophets, we are not going to make definite predictions about the prospect of motor fuel for the remote future; but it does seem that a careful analysis of the situation should not produce any pessimism about it. We know there is a wealth of energy in the world. Our problem is not one of the supply of energy, but rather one of converting energy that already surrounds us everywhere into the form that will serve us best.

Hence, American industry should not fail to take the steps necessary to insure that it shall never reach the stage where its energy supply will be as unusable as the water that surrounds the thirsty sailors in the tale of the "Ancient Mariner," becalmed for too long a time under the scorching sun of a Pacific sea, with

> "Water, water, everywhere
> Nor any drop to drink."

Those thirsty sailors thought that the failure of their drinking water was a curse sent on them because the ancient Mariner had shot that pious bird of good omen, the Albatross. But the curse that really caused their parched condition was ignorance—ignorance of the simple process by which the salty water of the sea that surrounded them on every side could have been purified and made potable.

Properties of the Motor Fuel of Tomorrow

THE most important properties of an automobile fuel are these:

1. High heating value.
2. Suitable volatility.
3. Freedom from tendency to knock.

The first of the items enumerated above may be passed by with a mere mention. So long as gasoline from petroleum forms our automobile fuel, its heating value will always be very high, and it will be pretty nearly the same for one gasoline as for another. The fuel forms such a small part of the combustible mixture with air—in the case of gasoline the ratio is about one volume of gasoline vapor to 50 volumes of air—that the heat of combustion of a unit volume of fuel-air mixture is substantially the same for all ordinary liquid fuels. Measurements have checked this by showing that the maximum power produced by a given engine is not greatly affected by changes in the calorific value of the fuel used.

With regard to the second point mentioned above, the volatility of a motor fuel is one of its most important properties, because the ease with which an automobile fuel vaporizes determines the degree of satisfaction with which it can be used in service. It is beyond the scope of this paper to write specifications upon just what volatility range of the motor fuel of the future should be. But there are two things of which mention ought to be made here.

The first of these is that the motor fuel of tomorrow should be a liquid that is quite easy to vaporize—one that can be used in an automobile, even when the weather is cold, without the application of much heat to the mixture to make the engine function as it should. The introduction of heat with the fuel-air mixture is undesirable, both because it seriously reduces the volumetric efficiency of the engine, and because it has a large influence in inducing knock.

A Universal Standard of Volatility

THE second point about volatility as applied to the motor fuel of tomorrow is that all automobile fuel should conform as closely as is possible commercially to some definite standard in this regard. It is not intended to intimate here at all that any given refiner does not make his gasoline uniform today. The thing suggested is the desirability of all refiners working as closely as is possible to the same specifications in the matter of volatility.

The periodic surveys made by the Bureau of Mines show that the products of different refiners have been varying over a wide range in the matter of volatility. Because it would appear to be a very desirable thing, it seems reasonable to expect that in the future all refiners will make their motor fuel pretty closely to one standard, just as the width of railroads is standard, and as tools for drilling oil wells are being standardized.

After all, the only reason for railroads being standard is because cars from everywhere have to run on them. And, although in a somewhat different sense, the same thing is true of gasoline—that all kinds of cars have to run on it.

It is possible that the time may not yet be altogether ripe for a universally uniform motor fuel, because the petroleum refining industry may not yet be in a position to produce such a fuel in an economical way. But the large extension of cracking, the process by which the molecular size and volatility of an oil is modified, is rapidly rendering it possible for automobile fuel to be adjusted to a uniform volatility everywhere within reasonably close limits. The motorist would benefit a great deal if petroleum refiners could all get together on this matter of volatility.

Freedom From the Knock

THE third important property of an automobile fuel is freedom from tendency to knock in automobile engines. It is only recently, to be sure, that the importance of this property has begun to be universally recognized.

But everyone, perhaps, is alive to the significance of the situation now, and every effort is being made to produce and to distribute automobile fuels that are free from knock. So nothing need be said here about the need for providing such fuels, nor about the great contribution they can make to motoring.

The biggest problem in connection with the general adoption of an anti-knock fuel has been the one of supplying the fuel. But so much progress has been made in this matter so far that its complete solution is already in sight.

There are two or three problems incident to the universal adoption of an anti-knock fuel that should be mentioned here. The first of these is the matter of standardization on some suitable degree of freedom from tendency to knock, which shall represent the minimum requirement for an automobile fuel. This problem brings with it two others: first, the working out and agreeing upon suitable methods for measuring intensity of knock; and, second, the adoption of a standard fuel against which degree of knock can be rated.

It is not possible now to say just what will or what should be agreed upon as the minimum standard for the automobile fuel of the future in degree of freedom from knock. It is estimated differ-

ently by different people, some of whom say that the motor fuel of the future must operate without knock in automobile engines having a compression ratio of 6.5:1, or even of 7.0:1, and some of whom say that American industry will be satisfied with a compression ratio of 6.0:1.

But, even if the ultimate engine compression could be known, we would still need more information to decide on the exact knocking properties of the motor fuel of tomorrow, for engines of the same compression ratio differ so widely in the way a given fuel functions in them that it is not yet possible to draw a definite base line for a satisfactory automobile fuel for the future, or even for the present. There are so many variables inherent in the operation of the automobile engine, that it is necessary to have a uniform reference fuel of known knocking characteristics against which tendency to knock can be rated, before an automobile fuel of standard knocking properties can be agreed upon.

Reference Fuel a Problem

THIS matter of a universal reference fuel is one of the three problems in this connection that were enumerated above. In the face of these uncertainties, the best that can be done in this paper is to point out the problem of standardizing on some definite degree of freedom from knock as one of those yet to be solved, without attempting to make predictions as to what its exact solution will be.

However, it may be said quite definitely that the automobile fuel of the future will have to be able to withstand a compression that is considerably higher than that of the present. What its exact knocking properties will be can be settled best on the basis of experience, some of which is yet to be had.

The matter of methods for measuring degree of knock and that of securing a standard fuel against which to rate the tendency of a fuel to knock are problems which the whole industry can help to solve. About 10 different methods of measuring intensity of knock are described in the literature, all of which can hardly be equally good. However, it is conceivable that any one of two or three different methods, either of those already in use, or of those which may yet be developed, could give equally dependable results. The thing that must be done is for comprehensive comparison of the suitability of the various methods to be made by as many different laboratories as possible, in order that those may be generally adopted which are best, and which give concordant results. At least one co-operative plan of this kind is already being carried out.

Finally, there is the problem of a standard or reference fuel to serve as a scale against which knocking properties may be rated. This is one for which no solution whatever that could be universally adopted was offered until just a short time ago. But, at the Philadelphia meeting of the American Chemical Society in September, Graham Edgar of the Ethyl Gasoline Corp. proposed that mixtures of normal heptane and of one of the octanes, tri-methylisobutyl methane, be used as reference fuels in measuring knock. These are both pure paraffin hydrocarbons that can be obtained by anyone who desires them, and the knocking properties of the two are such that by mixing them in varying proportions it is possible to duplicate the knocking characteristics of any gasoline that comes within the commercial range. Although this suggestion has not been worked out to commercial completion as yet, it appears as though it will afford a satisfactory solution of what has been a very perplexing problem. The important thing that yet remains to be done is for each member of the industry, who may be interested in the matter of measuring knock, to determine whether mixtures of these two suggested hydrocarbons can meet all of the requirements for a reference fuel as he knows them.

Payout Status of Oil and Gas Properties

By H. G. Humphreys
Skelly Oil Co., Tulsa

Read Before Group Session on Uniform Method of Accounting, A. P. I. Annual Meeting, Tulsa, Dec. 8

THE purpose of the accounting company's payout record is to show the excess of its share of expenditures (capital expenditures and operating costs) over its share of gross earnings, or, in the event the investment has "paid out," the excess of its share of gross earnings over its share of expenditures covering each property from the date of acquisition to the close of the last month of completed operations. For memorandum purposes only, properties that once produced and have become non-producing are included in the record; so also are properties the development of which consists entirely of dry holes.

Also it may be well to mention at the outset that the payout record contains no entries representing depreciation or appreciation of asset value nor are general and administrative expenses, interest expense, or theoretical loss of interest entered directly in the payout record, although they may be considered in connection with the summary drawn from the payout record.

The composition of the form of payout record is as follows:

I Miscellaneous data:
- (a) Lease name and number
- (b) Section, township and range
- (c) District, county and state in which property is located
- (d) Whether subject to ad valorem tax or to production tax in lieu of ad valorem tax
- (e) Proportion of interest of accounting company
- (f) Proportion of outside interests and by whom held
- (g) Well record as to number and kind (oil and/or gas)
- (h) Barrels of oil produced monthly from initial production to date (gross and net)
- (i) Contingent liabilities (carried interests including purchase obligations payable from the proceeds of oil).

II Expenditures:
- (a) Cost of oil and gas rights to accounting company
- (b) Lease rentals paid by accounting company
- (c) Entire intangible development costs
- (d) Entire material costs
- (e) Entire losses, depreciation and adjustments
- (f) Credit proportion of capital expenditures chargeable to joint lessee
- (g) Remainder being total capital expenditures of accounting company
- (h) Entire operating expenses
- (i) Credit proportion of operating expenses chargeable to joint lessee
- (j) Remainder being operating expenses of accounting company
- (k) Total expenditures of accounting company.

III Accounting company's proportion of gross earnings.

IV Excess of expenditures over earnings (or vice versa).

Spaces are provided for entries representing (a) additions (or changes) for each month (b) additions (or changes) for the year to date (c) cumulative totals from date of acquisition to date.

The bookkeeping procedure is to recapitulate all transactions for the month

according to individual leases or properties, subdivided by the payout classification and further subdivided by a detailed classification, the latter being posted (voucher reference, necessary description and amount) to a subledger which is maintained for analytical and auditing purposes in support of the payout record.

Definitions of Terms Used in Payout Record

THESE definitions, in the main, consist of the analytical classification already mentioned which embraces investment, operating and earnings accounts. Let us briefly consider the composition of these terms in the order previously listed.

II (a) Oil and gas rights

These may consist of one or more of the following general descriptions of title or beneficial interest.

1. Land owned in fee
2. Royalty
3. Overriding royalty
4. Working interest
5. Carried interest (including purchase obligations payable from proceeds of oil).

The cost of oil and gas rights acquired by purchase includes the original purchase cost or bonus together with the cost of verifying seller's representations and examining into, recording and protecting the title; also the amount of rentals paid (if any) during the period of non-development. The cost of a working interest would also include amounts that may be paid to a carried interest, as will be explained later.

Let us briefly consider the character of the five items mentioned.

1. Land owned in fee

As the name implies, this represents the title in fee simple to the surface as well as to the mineral and water rights of a given property.

2. Royalty.

This is the interest (say 1/8th) retained by the fee owner (on assigning oil and/or gas rights to a lessee) which entitles him or his assigns to dominion over a 1/8th share in the oil and/or gas mined and saved, without expense other than taxes applicable to such 1/8th share.

3. Overriding royalty

This is an interest that originates in connection with the assignment of rights in a working interest whereby the assignor retains an overriding royalty, (say 1/8th of 7/8ths working interest) which may be considered, for all practical accounting purposes as being in the same category as (true) royalty.

4. Working interest

This is an assignment of oil and/or gas rights (usually 7/8ths) originally granted by the fee owner. The holder of a working interest is privileged to enter upon the premises and explore for and produce oil and/or gas at his own expense and risk, but without damage to the rights remaining with the original fee owner or his assigns.

5. Carried interest

This is a beneficial interest (say 1/8th) retained by the assignor of oil and gas rights relating to a working interest. Carried interest is subject to contract, but the contract is not necessarily a matter of public record; its rights are limited to the express terms of the contract.

The company operating the property is responsible for the records whereby the amount inuring to the benefit of the carried interest is determined, which amount on being placed at the credit of the carried interest is charged, per contra, as additional cost (bonus) of the working interest in the lease.

If the working interest earnings do not "pay out" the expenditures, then the carried interest receives no benefit whatsoever, and the working interest has no claim against the carried interest for any loss resulting from the development and operation of the property.

For the reason that "a thing cannot, at the same time, be and not be," it may be set down as an axiom that, excepting possibly in cases where the contingent liability is stated in a specific amount, the actual benefits (if any) under a carried interest cannot be determined until the property on which it applies has been operated to exhaustion, salvaged and abandoned.

Fortunately, carried interests are not met with in most investments, but where they do not exist they should be carefully studied.

For the purpose of this discussion, let us consider this item of carried interest under two heads, viz:

(a) General carried interest

(b) Special carried interest

(a) General carried interest

A 1/8th general carried interest, in the event the working interest "paid out," would be paid off as shown in Table No. 1.

A "paid out" general carried interest would have title to 1/8th of the material, which is given in the foregoing formula in the application of credit for material transferred from the lease and the material salvaged on abandonment, at a condition value; the value of material remaining in the investment would represent loss and/or depreciation in value as between original cost and the condition value as determined on material being transferred or abandoned.

(b) Special carried interest

This would be paid off on somewhat the same basis as would a general carried interest, with the exception, however, that the deductions from earnings would be specifically enumerated in the contract. A special carried interest may, therefore, vary from other special carried interests according to the provisions specifically set forth in the respective contracts.

At this point it seems pertinent to mention that form of contingent purchase obligation of a working interest that is payable only from the proceeds of oil if, as and when realized until a certain fixed amount will have been paid. The practical accountant, of necessity, regards this liability as being in the same category as a carried interest since whatever is found to be payable thereon, according to contract, represents additional cost of investment.

II (b) Lease rentals paid by accounting company

If it be the policy of the accounting company to charge payments of lease rentals direct to general profit and loss account of the period covered by the rental, such payments should be reinstated for purposes of a true payout record.

II (c) Entire intangible development costs

These include intangible costs of all dry holes, producing wells and development of the property generally, and may be classified thus:

1. Geological survey
2. Engineering, locations, maps, etc.
3. Drilling and cleaning out
4. Initial torpedoes
5. Superintendence, labor, teaming and freight
6. Miscellaneous intangible costs.

Table No. 1

Entire earnings of working interest (say 7/8ths)	(say)	$500,000.00
From which deduct working interest costs:		
Original cost of lease		
Intangible development costs		
Material less transfers and salvage	Total deductions	
Operating expenses		
Local taxes including production taxes	(say)	300,000.00
Proportion of general and administrative expenses and interest		
Proportion of federal income tax		
Excess of earnings over expenditures		$200,000.00
Amount payable to carried interest (1/8th)		$ 25,000.00

II (d) Entire material costs

A typical classification of material would be:

Rigs and rig equipment
- Wood and/or steel rigs
- Rig irons
- Sand reel
- Bull and calf wheels
- Crown blocks

Buildings
Tanks—wood and/or steel
Boilers
Engines
Powers—band wheel and/or portable
Pumps—gasoline and/or steam
Motors, generators and transformers
Control and casing heads
Clamps, shoes and packers
2-inch, 3-inch, 4-inch and 6-inch line pipe
2-inch, 2½-inch, 3-inch tubing
4¼-inch to 20-inch casing
Gas traps and separators
Sucker and pull rods
Other equipment

In addition to the subledger showing quantities, description and amounts, which is maintained in the accounting department, a similar subledger, but carrying quantities of material only, is maintained in the material department, to which entries are made from purchase orders and transfers before they are sent to the accounting department, thus affording means for the material department to know currently the status of material on the properties.

At frequent irregular intervals, a physical inventory is taken of material on each lease which is compared with corresponding items in the material department's subledger; this subledger is then compared with the accounting department's subledger, thus effecting a triple check.

II (e) Entire Losses, Depreciation and Adjustment

THIS account is maintained so as not to disturb the integrity of the payout record by writing off material costs to reserves or profit and loss account before the property has become exhausted, salvaged and finally abandoned. On material being transferred, the proper material feature is credited at full cost and L.D. & A. account is charged with the cost less condition price at which the transferred material was billed. This account is also charged with uninsured losses through fire or tornado and also with charges representing adjustments arising from a physical inventory taken of the lease material, the respective material feature in each case being cleared by appropriate credit.

At the close of the accounting period, the aggregate of charges in the L.D. & A. account of all leases is ascertained; the sum is then deducted from the investment and also from the general reserve for depreciation but reinstated at the beginning of the next period. It may be contended that, nevertheless, charges should be made against reserve on each transfer of material with a corresponding entry for loss or gain to P and L and also that charges should be made to P and L when material is lost; the answer to these contentions would be that such charges would require to be reinstated in the payout record else the record would be incomplete; and if there were a carried interest existing against such a property, not to reinstate these items would operate to the advantage of the carried interest and, of course, to the disadvantage of the accounting company; furthermore, those contending for current adjustment of reserves would be compelled to admit that their reserves were correctly computed for all time, for if it were ever necessary to adjust the reserves fundamentally, would it not also be necessary to adjust every charge that had previously been made against the reserve? A reserve for the extinguishment of asset value in an oil or gas property, like a carried interest, is a mere estimate until the property against which it applies has been abandoned and, therefore, it should be general against all properties and generous enough to provide for all contingencies.

II (h) Entire Operating Expenses

DIRECT operating expenses consist of superintendence and labor, hauling, fuel and water used for other than cleaning out purposes, conditioning wells, repairs, and supplies.

It is customary with some companies to prepare a statement for the general superintendent showing direct operating expenses of each lease for the month, year to date, and inception to date, together with corresponding barrels of oil produced; copies of these are sent to the respective foremen in the field for their information and comment.

Other operating expenses consist of insurance of all kinds, idle time, gross production taxes, other taxes, apportioned operating expenses, and miscellaneous lease expenses.

II (f)-(i) Joint Lessees' Proportion

THE charges to the non-operating joint lessee are, of course, made by the operating company.

Providing care is exercised to see to it that all charges are accurately distributed in the books of account to the respective properties, it is not a difficult task to prepare the billing of all capital and operating expenditures on a given lease, and reduced the total to the proportion chargeable to the joint lessee.

General and administrative expenses are not taken into account on the payout record and, therefore, do not fall within the scope of the subject under discussion, but it is deemed not entirely improper to mention, parenthetically, that joint lessees are also chargeable with general and administrative overhead, usually on an agreed basis. As an appendix to this paper, there is submitted a statement giving the usual makeup of general and administrative overhead.

III Accounting Company's Proportion of Gross Earnings

THESE consist of all earnings other than the proportion that may accrue to royalty, overriding royalty and/or joint working interests held by outside parties. Carried interests or interests in the proceeds of oil held by outside parties should not be credited with earnings as such, notwithstanding that the extent of their beneficial interest is measured by gross earnings, or gross earnings less certain expenditures, according as the contracts are drawn, respectively.

These earnings from inception may be made up of

Sales of oil direct from the property (barrels and amount)

Oil used for fuel (barrels and amount)

Oil transferred to storage at prices prevailing at date of storage (barrels and amount)

Value of oil on the lease at close of accounting period (barrels and amount)

Gas sales (M cu. ft. and amount)

Gas used for fuel (M cu. ft. and amount)

Miscellaneous earnings from power, water and other facilities.

Conclusion

THE payout record is thus seen to be a complete history, covering each developed oil and/or gas property from date of acquisition to the last month of completed operations, showing all transactions of an investment, operating and earnings character that may be directly allocated to each respective property, and of produced oil and gas saved monthly.

In order to complete the picture, a summary should be drawn from the record to which should be added as costs:

(a) A proportionate charge of general and administrative expense
(b) A charge covering theoretical loss of interest during the period when expenditures exceeded earnings
(c) An estimate of the contingent liability in respect of carried interest or bonus payable from proceeds of oil, if any.

The result will be the payout status of each property.

Does not the picture of each property thus drawn afford the best means of placing a value on the same as between a willing seller and a willing buyer? We have the productivity of the property realized monthly to date from which a reasonable estimate of future productivity (say barrels of oil) may be made; in other words, the probable realizable price per barrel discounted to present worth less estimated costs per barrel for operating, general overhead and carried interest (if any) would leave a net price per barrel which, multiplied by the estimated barrels of oil unmined, would give the value of the property. Value

all properties on this basis, which would be attractive to a buyer, and the aggregate short of the ledger costs would give the amount of general depreciation reserve covering all properties as a unit, or the aggregate in excess of ledger costs would represent non-ledger appreciation.

Let us assume, for example, that a certain company's activities have to do entirely with oil and gas rights and that it has fairly valued its developed rights on the basis mentioned, and, in addition, has valued its undeveloped rights on a conservative basis as between a willing seller and a willing buyer; now, let us also assume that the aggregate valuation thus arrived at is exactly equal to the original investment cost of all rights. There being no impairment in the company's investment, why should its income be reduced by some theoretical deduction for depletion and depreciation? In other words, is there any sound economic reason why its income should not be transferred intact to "surplus available for dividends?"

As for income tax, it would appear that a tax levied against the oil producer on any other than the "payout" basis may prove, in many cases, to be something of the nature of extortion. Even if the tax were laid on this basis a specific rate of allowance should be made having regard for the hazardous nature of the oil and gas producing business. Then, an accountant would be in position to determine the approximate tax currently, while now he needs must wait until after the end of the year when he proceeds to dance to the tune of "The Vicar of Bray" as directed by the commissioner of internal revenue.

Appendix

OVERHEAD relating to the development and operation of oil and gas properties consists of the cost of general and administrative services rendered which cannot feasibly be allocated directly to each property benefitted by such services.

These services or functions consist of:

General management and direction.

Protection of the title to the property (if not capitalized).

Constant control of the material equipment on the property.

Preparing proper schedules for purposes of ad valorem taxes.

Preparing semi-monthly payroll and individual checks for the amount due each employee.

Computing premiums for workmen's compensation insurance also for property and public liability and settling any claims arising in connection therewith.

Maintaining purchasing department and material warehouses to facilitate delivery of materials and supplies necessary for the maintenance and operation of the properties.

Maintaining constant control of oil produced, oil sold and settlement therefor and oil stocks remaining on the properties.

Maintaining control of gas sales and miscellaneous earnings from power, water and other facilities and prosecuting settlements therefor.

Maintaining appropriate records, vouchers and files reflecting the functions performed and preparing therefrom at the close of each month a report of the operations of each property in detail showing earnings and expenses, oil produced and lifting cost per barrel for the information of the management and the general superintendent; also preparing statements at the close of each year for purposes of computing depletion and depreciation reserves for income tax and general balance sheet purposes.

The cost of these functions embraces:

Use of office space, furniture and general office equipment.

Light, heat and power.

Services

Executive department
General superintendent's department
Treasurer's department
Purchasing department
Material department
Legal department
Tax and claim department
Insurance department
Engineer's department
Accounting department
Stationery.
Postage.
Telegrams.
Telephone.
Automotive expenses.
Traveling expenses.
Miscellaneous incidental expenses.

Creed for American Oil Men

I BELIEVE in the oil industry. I believe in the men who compose it. I believe that our industry is unexcelled in patriotism and that its unfaltering support of our country in the late war and its strict subordination of profit to service demonstrated its loyalty to the Republic. I believe that it would meet any national crisis in the same spirit.

I believe that the industry and its personnel are peculiarly American in type and character, racy of this soil from which they sprang, and that the industry preserves in its explorations and its hazards the romantic and adventurous spirit of the pioneers who wrought this nation from a wilderness.

I believe that oil men are not surpassed by other men in plain business honesty; that, taken in mass, their business conduct is worthy of emulation by the men of any business, anywhere; and that the occasional misdemeanor of an oil man should no more convict our industry of vicious practices than the occasional default of a banker should bring opprobrium upon the honorable business of banking.

I believe that the oil industry has been singularly free from profiteering in time of peace as well as in time of war; that in view of an increase in the consumption of gasoline equal to 500 per cent in the United States in the last 10 years, the achievement of the industry in meeting that spectacular growth of demand without increase of cost to consumers reflects a degree of resourcefulness, energy and honesty which should evoke the pride and commendation of the American people rather than their resentment and condemnation.

I believe that the oil industry is today one of the most highly competitive of American industries and that in none other does the law of supply and demand operate more directly and effectively. I believe that oil products, when cost of production, manufacture and distribution as well as utility are taken fairly into account, are the cheapest commodities sold in America, and that our industry has performed a feat of great brilliance in making these necessaries of modern life so universally, conveniently and cheaply obtainable.

Finally, I believe that the American people in the long run judge fairly when they know the facts of a case fully; that suspicion and hostility often proceed from mere ignorance and misunderstanding; and that the oil industry will not be found wanting when weighed in the balance of an informed public opinion. Hence I believe that in all available ways the industry should endeavor to acquaint the people with its true story and to evoke sympathetic understanding of its problems and perplexities.

And when that has been done, I believe that the people will concede our right to a fair profit proportioned to our investment and peculiar hazards and to the worth of the service we render; that we shall find relief from some of the excessive tax burdens now laid upon us and the goods we produce; that politicians will no longer be able to use our industry as a patient ass upon which to ride into public office; and that hostile and discriminatory legislation will be more difficult of enactment because it will not be countenanced by public opinion.

Public Relations Work is Regarded Important Institute Function

Staff Special

TULSA, Dec. 7

THE importance of cultivating friendly relations with the public so that the people take a sympathetic view of the policies, troubles and problems of the industry, was stressed by C. C. Herndon, vice president and counsel of the Skelly Oil Co., in his address, "Cooperation in the Oil Industry," delivered at the general session which opened the seventh annual meeting of the American Petroleum Institute this afternoon.

He pointed to the defeat of a tax law unfavorable to the oil industry in Oklahoma at the November election as a concrete example of the good that can be done by educating the public to understand the point of view of the oil industry and the facts concerning it. Mr. Herndon said:

"If I were required to name the major project of the Institute which most strongly engages my personal interest, I would probably answer, the public relations movement. The reason lies in my conviction that without sound and understanding relations between our industry and the public, we shall build upon a foundation of sand, and our works, however worthy, will fail of just appreciation. What is the public relations movement and what can it accomplish?

"The answer to that question is a subject in itself as I learned a year ago when I prepared a paper for the Los Angeles meeting of the Institute, under the title "Getting the Public to See the Industry As It Really Is." But in the course of that paper I formulated certain articles of faith which I believed were the foundation stones of a better public understanding of our business.

Must Believe In Ourselves

"BEFORE we can expect the public to believe in us, we must believe in ourselves; and it is therefore worth while to test our own beliefs. So I composed a creed for myself as an oil man and if I do not tax your patience too greatly I shall repeat it here, as an epitome of my conception of the public relations movement. (See opposite page.)

Secretary Hoover, in his recent Tulsa statement, discussed public relations as well as conservation. Speaking from his position as secretary of Commerce, he said:

"'The way to do business in America today is to do it with glass pockets, and show the public what you really have and what you really are doing. You may take the cases of several industries which have adopted this policy and observe the very satisfactory results which have been obtained. The electrical industry was more or less in bad repute until it took its case directly to the public, and it has made use of publicity in the fullest sense of the word.

"'The result is that today the public has a splendid conception of the difficulties which beset that industry and is in accord with it.

"'The railroads may be cited as another example of the same medicine. Until they adopted the same method of giving the public the fullest details of their worries, they were also in bad repute. Like the electrical industry, they have acquainted the public with their problems and annoyances, and the result is that the railroads today have reaped innumerable benefits from informing the public of their tribulations.

"'I believe that the oil industry is clean and has nothing to fear from a program such as these other industries have adopted. When one considers the widespread distribution of gasoline and the very limited amount of profit in a gallon of gasoline, surely not over 2 cents per gallon considering everything, it is surprising. It is a wonderfully distributed product.'

Shows Work is Worth While

"THIS declaration by a cabinet member and sagacious business man, who sees our policies with impartial eyes, should go far to dispel doubt whether the public relations work is worth while. I invoke your continued support of the work. It needs your moral support and your financial support. You have doubtless heard of the man who had only one leg of his pants pressed when he had a profile picture taken. But I don't believe he was an oil man.

"Give our director of public relations all the aid you can, in every possible way. Don't be like the fellow who always grabs the stool when there is a piano to be moved. There is work for everybody in this field of public relations. The ground has been prepared for an expanding activity and you will be called on for co-operation in one way or another as the new year unfolds. No other branch of our co-operative effort will bring rewards in such intangible forms as the public relations work, but none will bring rewards more surely.

"The discussion of public relations leads to the topic, legislation, another field of activity for the Institute, and the last with which I shall deal. Public relations and legislation are kindred topics because efforts to prevent unwise or unfair legislation are effective in proportion to the strength of our claim upon public friendship and understanding.

"The Institute has been alert to turn aside hostile and discriminatory proposals. It has been on the watch for unsound legislation and has been able to prevent a great deal of it. You will perceive that here also is typically a field for such organized co-operation as the Institute makes possible.

Achievement In Oklahoma

"I REVERT for a moment to one of the local associations, to tell you of a recent accomplishment which emphasizes the value of organization and co-operation. Under the initiative and referendum clause of the Oklahoma constitution, a bill was initiated by politicians with whom this form of activity has become habitual.

"The bill proposed to change the law taxing the gross production of oil and gas, and thereby to increase materially the rate of tax. The proposal was unsound and unfair because the oil industry was already paying its adequate share of the cost of government; but there was danger six months ago that the bill would receive a majority of votes and become law. It was obviously necessary that the facts of the case be presented fully and clearly to the voters of Oklahoma before the election in November.

"For this purpose a co-operative organization was formed under the sponsorship of the Mid-Continent Oil & Gas Association. With the collaboration of Oklahoma oil men of all classes an educational campaign was waged and the equities of our position were so thoroughly impressed on the people of the state that the bill was defeated overwhelmingly, the negative ratio being more than three to one.

"Here was a piece of highly constructive work. It was local to one state; but if need should arise the Institute could mobilize the same kind of co-operative effort on a national scale, because its relation to the industry as a whole does not differ essentially from the relation of the Mid-Continent Oil & Gas Association to the industry in Oklahoma.

"In a very general way I have touched upon a few of the co-operative activities on the program of the Institute. My purpose is to stimulate your thought about co-operation and to make it the key-note of this meeting. It is a word that I hope to hear often spoken by oil men; for if we can keep ourselves thinking about co-operation we are certain

to practice it, and from its practice benefits will come to us in many forms.

"The year 1926 is approaching its close and our minds turn toward plans and prospects for 1927. We have been favored with a year of prosperity.

"Although prophecy is dangerous, I hazard the prediction that we shall have a satisfactory and profitable year in 1927. I think the preponderance of evidence supports that opinion. The burdens that bore upon our industry and others as an aftermath of war are lifting, notably the burden of federal taxes. At one time these taxes were so high that a business man might well have feared that in a moment of aberration he had authorized somebody to charge the war to him.

"The oil business is not in perfect balance. It is doubtful whether it should be. The constant change of positions and conditions, the rising and falling of production and prices, the sequential action and re-action among the branches of an integrated industry, are marks of growth and vigor, and will be tempered by the co-operative contacts made possible through the facilities of which this Institute is the conspicuous example. I, for one, turn my face toward the new year with optimism and confidence."

PARKWATER, SPOKANE, WASH.—A treating plant for gasoline and kerosene which will have a capacity of 2000 barrels daily, is being built here by the Inland Empire Refining Co., of Parkwater, a suburb of Spokane. The plant will be supplied from Montana refineries.

Kansas City Leads In Making Tanks

KANSAS CITY, MO., Dec. 6.—This city enjoys the distinction of being the leading steel tank manufacturing center in the world, ranking first among cities making steel tanks. It has 10 companies which engage in making tanks of all types, sizes and for every purpose.

Tanks all the way from 1 to 4,000,000 gallon capacity are made here. These include tanks for oil field use, for field and underground storage, for bulk and filling stations and for trucks; for domestic use; for farm use; for water wagons; also engine tanks, cistern tanks, water storage and water tower tanks.

The steel tank industry employs 2200 individuals in Kansas City, not including the erection crews in the field. The payroll of the 10 companies amounts to over $3,000,000 annually. Approximately 120,000 tons of steel are consumed yearly in this city in the manufacture of steel products.

The oldest concern is the Columbian Steel Tank Co., which began in business in 1894 as a "one-man" concern. A. A. Kramer, who is still the president of the Columbian, began in business 32 years ago with a tin shop making tanks for farm use. Now that company makes steel tanks for oil field and station, as well as portable steel buildings, truck bodies, corrugated roofing, dump bodies, hoists, etc., and has developed a fireproof truck tank for the transportation of gasoline. A new plant completed the past year is the first step in its present expansion program. Branch offices are maintained at New York, Dallas, Tulsa, Los Angeles and San Francisco.

The Butler Mfg. Co., another large steel tank manufacturer, builds ready-made steel buildings, such as bulk and filling stations, and a complete line of oil marketing and jobbing equipment.

The Kaw Steel Construction, which specializes in heavy steel plate manufacture, makes oil tanks of from 100 to 80,000 barrel capacity, designed for use at oil refineries, power plants, storage plants, etc.

The other steel tank manufacturers include the American Steel Works; Black, Sivallas & Bryson Mfg. Co.; Kansas City Steel Tank Co.; Kansas City Structural Steel Co.; Missouri Boiler Works; Standard Steel Works; and Superior Steel Tank Co., the latter specializing in the manufacture of oil tanks up to 20,000 gallon capacity.

Radiant Oil Dealers Feted

LIMA, O.—More than 100 oil marketers and dealers within a 50-mile radius of Lima, attended the dinner which the Radiant Oil Co., compounder and jobber of Charm oils and greases here, gave to their dealers recently at the Barr Hotel.

E. E. Bessire, vice president, and E. T. Lippincott were the principal speakers. Demonstrations of motor oil were made at the banquet and also alcohol testing apparatus for radiators.

A Correction

DR. T. G. DELBRIDGE, supervisor of the process division of the Atlantic Refining Co., calls our attention to typographical errors in the publication of a paper, "Color Determination of Lubricating Oils by Means of Chemical Solutions," published on page 102 of the Nov. 3 issue of National Petroleum News. The paper was the work of J. P. Carter and H. M. Hancock of the Atlantic Refining Co. and was read by Dr. Delbridge, before Committee D-2 of the American Society for Testing Materials at Cleveland, Oct. 15.

One paragraph in the text of the paper stated "that color which matched Lovibond glasses in 1914 still matched the glasses in 1919." As published in N. P. N. the paragraph read: "Color which matched, etc., in 1924, still matched in 1919."

There were several mistakes in a table of color range formulae which accompanied the paper. This table is reprinted herewith in corrected form. We are glad to take this opportunity to correct these mistakes.

Color Range Formulae

N.P.A.Color	Formulae	Per Cent	N.P.A.Color	Formulae	Per Cent
¼	$FeCl_3$ No. 1	12.74	2¼	$FeCl_3$ No. 3	25.38
	$CoCl_2$ No. 1	1.62		$CoCl_2$ No. 2	22.97
	Diluent	85.64		Diluent	51.65
½	$FeCl_3$ No. 1	25.49	2½	$FeCl_3$ No. 3	17.46
	$CoCl_2$ No. 1	3.03		$CoCl_2$ No. 2	33.33
	Diluent	71.28		Diluent	49.21
¾	$FeCl_3$ No. 1	38.22	2¾	$FeCl_3$ No. 3	23.95
	$CoCl_2$ No. 1	4.84		$CoCl_2$ No. 2	16.66
	Diluent	56.94		$CoCl_2$ No. 3	5.98
1	$FeCl_3$ No. 1	50.98		Diluent	53.41
	$CoCl_2$ No. 1	6.47	3	$FeCl_3$ No. 3	30.43
	Diluent	42.55		$CoCl_2$ No. 3	11.96
1¼	$FeCl_3$ No. 1	25.49		Diluent	57.61
	$FeCl_3$ No. 2	25.00	3¼	$FeCl_3$ No. 3	40.95
	$CoCl_2$ No. 1	7.09		$CoCl_2$ No. 3	13.33
	Diluent	42.42		Diluent	45.72
1½	$FeCl_3$ No. 2	50.00	3½	$FeCl_3$ No. 3	51.47
	$CoCl_2$ No. 1	7.70		$CoCl_2$ No. 3	14.70
	Diluent	42.30		Diluent	33.83
1¾	$FeCl_3$ No. 2	25.00	3¾	$FeCl_3$ No. 3	25.73
	$FeCl_3$ No. 3	16.66		$FeCl_3$ No. 4	26.32
	$CoCl_2$ No. 1	3.85		$CoCl_2$ No. 3	7.35
	$CoCl_2$ No. 2	6.32		$CoCl_2$ No. 2	23.68
	Diluent	48.17		Diluent	16.92
2	$FeCl_3$ No. 3	33.33	4	$FeCl_3$ No. 4	52.63
	$CoCl_2$ No. 2	12.64		$CoCl_2$ No. 2	47.37
	Diluent	54.03			

N.P.A.Color	Formulae	Per Cent	N.P.A.Color	Formulae	Per Cent
4¼	$FeCl_3$ No. 4	49.51	6	$FeCl_3$ No. 4	35.44
	$CoCl_2$ No. 3	15.21		$CoCl_2$ No. 4	31.65
	$CoCl_2$ No. 2	23.68		Diluent	32.91
	Diluent	11.60	6¼	$FeCl_3$ No. 4	42.21
	$FeCl_3$ No. 4	48.97		$CoCl_2$ No. 4	30.77
4½	$FeCl_3$ No. 4	46.38	6½	Diluent	27.02
	$CoCl_2$ No. 3	30.43		$CoCl_2$ No. 4	29.89
	Diluent	23.19	6¾	Diluent	21.14
	$FeCl_3$ No. 4	55.74		$CoCl_2$ No. 4	29.00
4¾	$FeCl_3$ No. 4	52.74	7	Dilue	15.26
	$CoCl_2$ No. 3	35.66		$CoCl_2$ No. 4	28.12
	Diluent	11.60		Diluent	9.38
5	$FeCl_3$ No. 4	59.10	7¼	$FeCl_3$ No. 4	46.87
	$FeCl_3$ No. 4	62.50		$FeCl_3$ No. 3	1.59
	$CoCl_2$ No. 3	40.90		$CoCl_2$ No. 4	42.37
5¼	$FeCl_3$ No. 4	53.19		Diluent	9.17
	$CoCl_2$ No. 3	30.67	7½	$FeCl_3$ No. 4	31.25
	$CoCl_2$ No. 4	7.91		$FeCl_3$ No. 3	3.19
	Diluent	8.23		$CoCl_2$ No. 4	56.61
5½	$FeCl_3$ No. 4	47.27		Diluent	8.95
	$CoCl_2$ No. 3	20.45			
	$CoCl_2$ No. 4	15.83	7¾	$FeCl_3$ No. 4	15.62
				$FeCl_3$ No. 3	4.78
	Diluent	16.45		$CoCl_2$ No. 4	70.86
5¾	$FeCl_3$ No. 4	41.36		Diluent	8.74
	$CoCl_2$ No. 3	10.22	8	$FeCl_3$ No. 3	6.38
	$CoCl_2$ No. 4	23.74		$CoCl_2$ No. 4	85.11
	Diluent	24.68		Diluent	8.51

operating margin regardless of price fluctuations

Should you want to crack gas oil or distillates, the Dubbs Process will do it more profitably and completely than any other —with less equipment, less capital investment, less operating cost

And it does it in one operation—not two, three or four

Universal Oil Products Company
Owners of the Dubbs Process
310 South Michigan Ave
Chicago, Illinois

Bradford Producers Told How to Halt Heavy Evaporation Losses

By Roger B. Stafford
N. P. N. Staff Writer

BRADFORD, PA., Dec. 6

PRODUCERS in the Bradford field are suffering evaporation losses of 7 to 10 per cent on their crude, A. E. Booth, president of the Northwestern Pennsylvania Oil Producers' Association, told the association's members at their annual meeting yesterday at the Bradford Country club. Production in the Bradford field is approximately 10,000 barrels a day. This volume means that producers are letting close to 700 to 1000 barrels of oil, mostly gasoline, blow away every day of the year. At the present price of Bradford crude the loss would run $868,700 to $1,241,000 a year, he said.

Losses can be reduced to less than 1 per cent, Paul D. Torrey said. Mr. Torrey is the U. S. Geological Survey geologist who was assigned to the Bradford field last year and who is now mapping the field and doing other research work for the Northwestern Pennsylvania association under leave of absence from the survey.

Several remedies to overcome most of the evaporation were suggested by Mr. Torrey. The chief remedies were these:

1. Prevent splashing and spraying of oil in the flow tanks.

2. Use tight roofs to prevent circulation of air over oil.

3. Keep run tanks in shade, housed if possible, but where exposed to the sun's rays coat them with light paint, preferably aluminum.

4. Use oil tight flow tanks.

5. See that lease hands use more intelligence in steaming crude to dehydrate it.

Loss of Some is Small

"SOME producers in the Bradford field have a loss of only 0.5 per cent between the well and the run tank," Mr. Torrey said, "but some losses run up to 15 and 18 per cent. Bradford oil is more difficult to handle than many other crudes. It is more volatile and the viscosity is lower.

"Losses from evaporation on leases fall into three classes: 1, losses at the well or flow tanks; 2, losses in the run tanks, and 3, losses in steaming or dehydration.

"On one property where the evaporation loss was very low I found the barrel or flow tank was well protected and the pipe from the well was down to an inch of the fluid level. This eliminated spraying and splashing.

"There can be a great deal of evaporation on even a cold day," Mr. Torrey continued. If the tank roof allows air to circulate over the crude, the air becomes saturated with oil vapors and 10 to 15 per cent of oil is swept away. Oil holds its gravity in steel tanks better than in any other storage. There is complaint that steel tanks freeze but one company insulates its tanks with straw and hay. This insulation keeps out the heat in summer as well as in winter."

Redwood is Best of Woods

WHERE it is necessary to move the lease tanks and producers find that wooden tanks are more economical than steel, they should use only redwood tanks, Mr. Torrey advised. Redwood not only is more resistent to warping than other woods but it offers less of a fire hazard than many other woods. The black on flow tanks is probably due to oil seeping through the grain of the wood or through small leaks elsewhere. All knotholes should be painted, he explained.

"On seeing some leases with their leaky stuffing boxes and rusty pipe one wonders how they can be made to pay," he commented.

Splashing and spraying of oil in both the flow and run tanks might cause half of the evaporation losses, Mr. Torrey declared, because splashing and spraying created a larger air area.

Some producers who run their intake pipes too near the bottom of their tanks, relieve back pressure on the intakes by perforating the elbows. Other producers let the oil flow down the sides of the tank to prevent splashing. There will be less evaporation loss in a full tank than in a partly filled tank, Mr. Torrey said, because the full tank has less space for the circulation of air. Oil in a full run tank will have a higher gravity than oil in a partly filled tank. Aluminum paint will keep the temperature of the oil 20° F. lower than the outside temperature.

Mr. Torrey told of having heard one pumper tell how fast he could heat a tank with steam. He gauged a tank this pumper was to steam. It contained 93 barrels of crude. When heated from 52° F. to 102° F. the tank lost 119 gallons of oil or almost three barrels. The dollar value of this loss was almost $12.

Loss From Well to Refinery

MR. BOOTH, in his comment, said that Bradford crude averaged 46 to 46½° A.P.I. at the well but when the crude was delivered to the refiners the average was only 42 to 43° A.P.I. That loss amounted to more than the cost of the research work the association is undertaking to increase production in the field, Mr. Booth said. The association is asking only 20 cents an acre from Bradford field producers to pay all expenses of the investigations.

Mr. Torrey in beginning his talk said he and the Pennsylvania State Geological Survey hoped to complete a contour map of the Bradford sand by next summer. The contour lines are to show each 5-foot difference in the elevation of the sand.

Gravity of Bradford oil varied a great deal in different parts of the field, Mr. Torrey said. At the highest part of the geologic structure the oil had a gravity of 48° A.P.I. but at the edges near the contact with the water flood the gravity was 42½ to 43° A.P.I. Gravity of crude on a lease varied with the movement of the flood, he said.

Sometimes gravity increased, but sometimes decreased. There were various explanations for the phenomenon, he said. Texture of the sand had something to do with gravity variations, he said. Where sand was porous the lighter hydrocarbons escaped more easily and more quickly than the heavier hydrocarbons. This condition would mean a fall in the gravity of the crude recovered.

In other cases, water flowing to the bottom of the sand and gradually filling the lower parts of the producing areas, pushes the oil upward so that near the end of a flood a bank of light oil may have accumulated toward the top of the sand. Gravity often decreased where the sand was thin or broken with shale or slate.

Rates of Water Flow

JERRY B. NEWBY, Petroleum Reclamation Co., Bradford, speaking for H. M. Ryder, research engineer of his company, who was unable to attend, said they had determined that each well had a definite pressure head below which pressure the well would take water very slowly but over which flood could be accelerated. The rate of flow of water in some of his company's wells, he said, was measured with a float to which was attached a light line which ran to a gauge calibrated in barrels.

Mr. Ryder has devised a flow meter to determine the rate of water reception by the sand, Mr. Newby announced. This instrument is a brass tube, beveled to seat on the greater seat of a flood well. In this tube were placed revolving vanes like the blades of an electric fan. An electric contact was attached to

one of the blades and another contact to the brass tubing which was grounded.

A small battery was put into a circuit with an instrument which would click when the circuit was closed. Once each revolution of the fan the circuit is closed and the instrument clicks. By previously determining in the laboratory the number of revolutions per barrel of water passing through the meter and counting the clicks in a certain period, the rate of water flow into the sand through the well could be ascertained, he said. Mr. Newby did not explain how a short circuit in the well was overcome. A telegraph instrument could be used, or an induction coil and spark plug, in the latter case sparks and not clicks would be the annunciator.

Mr. Ryder is working on a theory that drill cuttings may be taken to determine the porosity of the oil sand, Mr. Newby said. Mr. Ryder took small chunks of Bradford sand and found they lost 17 per cent in weight when roasted to drive off the oil. Technique of this method is yet to be worked out, Mr. Newby added.

A microsopic study of the Bradford sand and ocean sand was made by Mr. Ryder. The Bradford sand was coarse and rough whereas the ocean sand was fine and smooth. Character of the sand may have something to do with rate of flood movement, it is believed, the present hypothesis being that water will flow faster where the sand is relatively smooth.

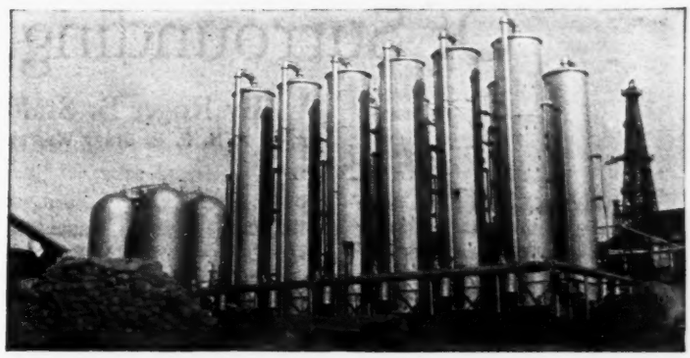
R. J. Alexander Talks

RODNEY J. ALEXANDER, secretary of the Pennsylvania Grade Crude Oil Association, related the problems of his organization and the necessity of creating and maintaining a quality market for Pennsylvania lubricating oils. He attributed the present low market for Pennsylvania cylinder stocks to the falling off of foreign demand. This decline in buying by exporters, who formerly took about half of the Pennsylvania cylinder stocks output, followed the shipment of several cargoes of cylinder stocks to Europe represented to be Pennsylvania oils which, at least in part, were made of other crudes, he said.

"Although those cargoes failed to shake faith in Pennsylvania oils, they caused export demand to decrease materially," Mr. Alexander asserted. "Now there is an excess of heavy lubes on the American market."

Mr. Booth urged the producers to support the Pennsylvania Crude association. His own association is advertising Pennsylvania oils in the Bradford papers. His association also contributed toward the support of the other organization's exhibit at the Sesquicentennial Exposition.

These directors were elected by acclamation: W. C. Purple, W. J. Healy, H. H. Redfield, W. T. Piper, E. C. Emery, A. E. Booth, Jerry B. Newby, O. F. Thompson, and Charles Stevenson. Officers are to be elected later by the directors.



The World's Largest
casinghead
gasoline plant
uses eleven
Campbell Absorbers

Rated Capacity—44,000,000 feet, capable of carrying an overload of up to 80,000,000 feet.

May we give you more facts?

J. A. Campbell
Consulting Designing Construction
P.O. Box 669 *Natural Gas Engineer* Long Beach, Calif.

CAMPBELL
OIL FROTH
absorber

TRANSIT Red Head TONGS are the only genuine Klein Tongs

Bulletin 5-C "Tools for Pipe Line Construction" on request

NATIONAL TRANSIT PUMP & MACHINE COMPANY
OIL CITY, PA.
District Offices: **New York, Philadelphia, Tulsa, Cleveland, Pittsburgh, Houston and Denver**

Service Station Increases Values Of Surrounding Property

By Roger B. Stafford
N. P. N. Staff Writer

SALAMANCA. N. M., Dec. 4

OIL companies sometimes encounter opposition when their intention to build a filling station in a residential neighborhood becomes known. This was not the case with the Metro Stations, Inc., Olean, N. Y., however, when it became known a few months ago that it would erect at Salamanca on the Southern Tier highway of New York a station that would be a credit to the city.

The station is perhaps the prettiest building in Salamanca. Since it was constructed property in its vicinity has increased in value.

"What sort of a station is this that has an effect on residential property owners that is opposite the experience of many oil companies?" the reader probably has already asked himself. Just turn back to the cover page and you will see a picture of this station.

Now that you have an idea of what the station looks like, you probably will say, "Yes but we cannot spend $10,000 or $12,000 for a service station. So much money spent in such a way would never be recovered."

The objection is overruled. This station cost only about half the sum one would expect. C. R. Macauley, general manager of Metro Stations, says the building itself cost only $5,600. The 160 by 200 foot lot, and the equipment brought the total cost to only a little more than many an oil company has put into a station that has only part of the attractiveness and advertising value of this Metro station.

Style is Elizabethan

THE architectural style of the station is Elizabethan. The walls are of antique plaster. A front gable is of the same material and finish but gables at each side are of half timber. The roof is of Tudor slate in ten shades.

The chimney is built of rubble stone at the base and of rubble stone and plaster above the eave. Five colors have been noted in the stone. A large wrought iron S brace gives an air of stability to the upper part of the chimney. This brace is not visible in the picture published on the cover but the bar which anchors the chimney to the roof is shown.

Wrought iron is used extensively for hardware. Hand wrought brackets support a flower box under the window framed in the front gable. Wrought iron lanterns are over the door leading to the salesroom, half of which is visible from where the picture was taken. Another lantern is suspended from a wrought iron bracket near the door in front which is the entrance to the rest room for women. All yard lights are of the lantern type mounted on wrought iron standards. There are wrought iron strap hinges on the orange batten door in front.

All walks about the station are of flagstone. All gutters and conductor pipes are of copper. The windows except in the front wing have leaded diamond shaped plate panes. In the front wing the casement windows have small rectangular panes with wooden muntins.

The front wing, which is really only an ell, has the appearance of having been built at a later age than the rest of the building. This difference in seeming age is accentuated not only by the different style of the gables and windows but also by the roof. The comb of the main part of the station sags; the comb of the ell is straight.

In Women's Rest Room

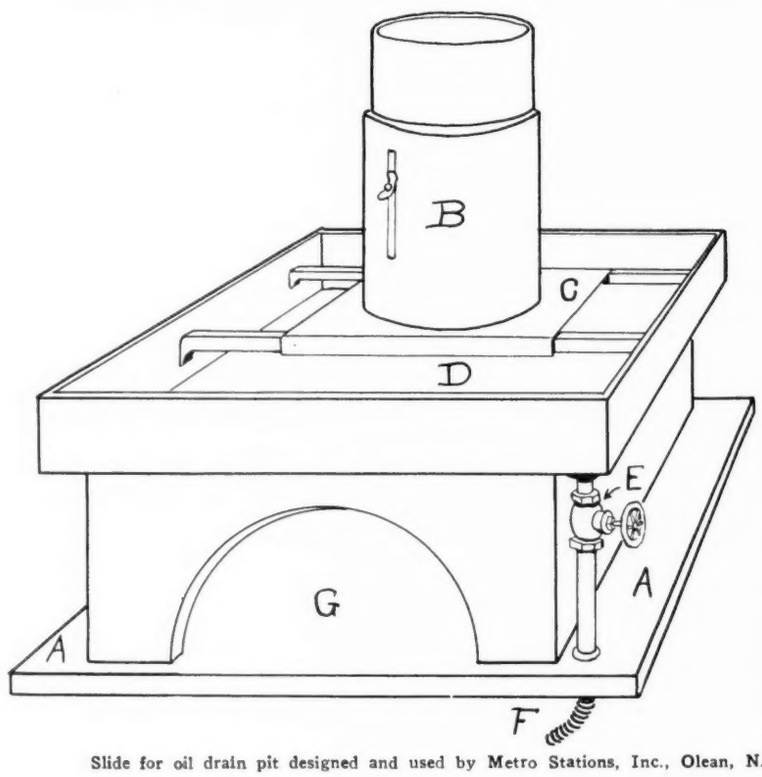
FLOORS of the station are red tile. The walls of the women's rest room are of rough plaster finished in two tones—a soft gray background with a silver finish. A central lighting fixture, brackets that support English ivy-filled hanging baskets and a reading lamp are of wrought iron enameled orange. The fireplace is of rubble stone, the same as the chimney.

Curtains are of glazed chintz. An easy chair is upholstered in needlepoint. A Windsor chair, and gateleg table is made of maple, antique finish. A somewhat later note is the parchment shade for the reading lamp which contains a Godey print. In a door leading to the lavatory is a full length mirror.

The decorations and general appointments were selected by Mrs. Macauley. wife of the general manager, who has an artistic bent.

So much for the esthetic. Perhaps the reader is more interested in the practical. The only excavation was under the rear of the salesroom, underground space being provided there for lubricating oil tanks. Kerosene, alcohol and gasoline tanks are underground outside the station building.

The room for air compressor and heating plant is in the center of the building. A door to it leads from the salesroom. Light enters through a Florentine window which forms one side of a hall leading from the women's rest



Slide for oil drain pit designed and used by Metro Stations, Inc., Olean, N. Y.

room to the lavatory. The entrance to the men's lavatory is in the salesroom.

Use Metered Outlets

THERE are three two-way Erie metered gasoline outlets, painted white, on islands between two drives. All these dispensers are within sight of the attendant's desk which is just back of a shallow display window, shown at the extreme right in the cover picture. Two of the dispensers are shown in the cover picture. The third is further to the right.

The lubricating oil equipment is hand operated Bowser. Rhodes bottles are used for replenishing service. There is one draining pit and this is kept spotless.

The most interesting feature is the adjustable receptacle for catching the waste oil which was built by the Metro's own men after a design by Mr. Macauley. The sketch is a perspective of it.

The receptacle as shown in the sketch is attached at the sides of tray A to barn door hangers, which run on trolleys fastened to the sides of the pit. B is a telescopic sleeve which may be raised and lowered so that it will fit closely against the crankcase of a car to prevent splashing of oil. The smaller sleeve which slides up and down, is secured by two thumb screws which slide along a slot in the larger sleeve.

Further Details

C IS a slide of sheet metal which moves crosswise of the pit on two 1-inch angle irons shown in the sketch. D is an oil catch tray with sump in one corner. At the bottom of B is a wire screen which catches the crankcase plug or anything else that might slip away from the attendant. E is a valve below the sump which is kept closed when a car is being drained. Waste oil is held in tray D. F is a flexible hose which runs from one end of the pit to a storage tank under the pit or between the pits when there are two or more. G is space for wrenches, grease guns and other tools.

When a car is driven over a pit the attendant pulls the whole device under the crankcase, adjusts the sleeve and removes the plug. Tray D is of ample size to hold drainings from the largest truck oiling system. When the tray is filled after a draining or two, the attendant pushes the device to the hose end of the pit, attaches the hose and opens valve E. There is no soiling of the pit walls. The waste oil is removed from the larger tank by putting air pressure on it and blowing it to drums on a truck.

Crude from Cosden Well High In White Product Yields

By Paul Wagner
N. P. N. Staff Writer

HOUSTON, Dec. 6

OIL taken from the A-1 Connell well of J. S. Cosden et al, in sec. 13, block 16, southern Ector county, west Texas, tests 35.2° A.P.I. gravity and shows a gasoline content of 33.3 per cent in laboratory distillation. The oil comes from a lime pay horizon at 3435-3535 feet. The well is now standing with 1700 feet of oil in the hole at total depth of 3750 feet.

The sulphur content of the Connell well oil is 1.21 per cent, which is similar to the showing in this regard of other producing areas in the Permian age salt basin of west Texas. Color of the oil is dark green. Its viscosity (Saybolt) is 49 at 70° F., and 41 at 100° F.

Distillation tests on samples of the crude follow:

2500 c. c. charge; vis., at 70°-49; vis., at 100°-41; cold test, zero and flowing:

Benzine	30%
Grav.	56.8
I. B. P.	130
E. P.	439
Kerosene	15.2%
Flash	144
Fire	166
Grav.	41.3
Gas oil	3.3%
Grav.	37.4
Flash	200
Fire	240
Wax Distillate	14.4%
Grav.	30.0
Flash	260
Fire	300
Vis	56-100°
C. T.	52
Bottoms	35.8%
Grav.	17.0
Flash	430
Fire	495
Vis.	56-100°
C. T.	48
Color	Black
Loss	3.0%

Engler Dist: 10-178; 20-202; 30-220; 40-238; 50-254; 60-274; 70-298; 75-314; 80-328; 85-348; 90-374; 95-416; E.P.-439.

Atmospheric Distillation

Temperature Cut Degrees F.	Product	Volume C.C.	A.P.I. Grav.	Yield Pct.
Gasoline 392 - 527	100	56.3	33.3 Up to 392	
	Kerosene	52	41.3	17.3

Vacuum Distillation at 40 M. M.

Up to 437	Gas Oil	33	33.6	11.0
437 - 527	Light Lube Dist.	34	31.0	11.3
527 - 572	Medium Lube Dist.	17	27.1	5.7

PROFIT
What Is It?

Does it mean merely buying oil at one price and selling it at another? Supplying those who patronize you because they happen to, or because they think you are a fine fellow?

Profit is one of the most interesting and intriguing words in the English language, and to capitalize it you must sell not only yourself and your service, but some real, understandable reasons why the oil you handle gives the best service.

Jobbers handling Humble Oils know all of the reasons why people should buy their oils instead of other brands. They *believe* in these reasons themselves, many of them having been developed through experience. Consequently, their businesses are outstanding and profitable.

The Humble Oil & Refining Company operates no filling stations. Humble Products are sold at wholesale only. We can take care of your requirements in any quantity—in lithographed packages, drums, a carload or a cargo. We control every step in production and manufacture—from the wells to you.

Write, wire or phone for samples and prices.

Humble Oil & Refining Company
Houston, Texas
Producers - Pipe Lines
Refiners - Marketers
"Zero Cold Test Oils"

HUMBLE OIL & REFINING CO.
HUMBLE OILS
Reg US Pat Off
HOUSTON, TEXAS

Mounting Production in California Likely to Bring Crude Cuts

By Rufus J. Pilcher
Statistician for Richfield Oil Co.

Read Before Los Angeles Branch of American Institute of Mining and Metallurgical Engineers, Nov. 30

PRODUCTION of crude petroleum in California is now, Dec. 1, 1926, more than 650,000 barrels per day. Divided geographically from Ventura County south we have for Southern California approximately 475,000 barrels, and for Northern California about 175,000 barrels per day.

One year ago, daily production was about 625,000 barrels per day, but, whereas at that time the high peak had occurred in September, 1925, and production was on the downward trend, it is now mounting upwards, and the peak is still several months away. I believe that this peak will be reached before July 1, 1927, and will amount to a figure in the neighborhood of 675,000 barrels per day, and production will then decline. For July 1, 1927, my estimate is in round numbers 632,000 barrels per day.

In just what month this high peak will be reached is, of course, difficult to estimate, but undoubtedly during the early part of 1927.

In forming a guess as to when the high point in the production curve will occur, there are several factors to consider. One important consideration is the policy of the largest developers and producers, who are largely in control of several of the new pivotal flush fields. In formulating previous estimates I have several times assumed that the oil companies which practically control fields with an apparent high potential production would follow a conservative drilling policy during an over-production period.

Production Was Not Held Back

MY assumption took into consideration that the big companies concerned would be interested in keeping the production down and the price up. However, in the case of several notable fields I have been wrong. Just when it appeared to me that the company or companies concerned were in no particular need of oil and the price structure was to be maintained, somebody pulled the cork and much oil was spilled where much less would seem to have been sufficient and the market would not have been disturbed.

Right now there are three fields in Southern California capable of materially disturbing the production situation. These are Huntington Beach, Ventura Avenue and Seal Beach. First in immediate importance is Huntington Beach, now producing nearly 85,500 barrels per day. The new town lot part of the field is producing about 46,000 barrels, and the older field nearly 40,000 barrels per day.

THAT reductions in the price of California crude oil will be brought about before long because of the increasing production there and because of the fact that heavy oils have been accumulating for some time, and light refinable crude during the past month or so, is brought out in the accompanying paper.

The author believes the peak of the present upward trend in California production will be reached during the first half of 1927 and that this peak will be around 675,000 barrels a day. Production on July 1 this statistician estimates at 632,000 barrels daily. Editor

The town lot field of course, is being far too intensively drilled and will decline as rapidly as it has risen, once the major drilling campaign now on has stopped. I believe the peak will be reached soon after Jan. 1, and will not exceed 95,000 barrels per day for all of Huntington Beach, and by July 1, 1927 the production will have declined to 65,000 barrels a day.

Ventura Avenue Is Mounting

VENTURA Avenue is still in its flush stage and has contributed a large amount of oil, which has been steadily increasing during the past year, from 30,000 barrels a day to nearly 60,000 barrels present production, altho there have been only 23 or 24 wells completed.

The wells in this field are big producers and come in from 2000 to 5500 barrels per day from depths that make them the deepest commercial producers in the world. The later completions are all from 5500 to 6600 feet deep and required several months to drill. Their decline is rapid and in some cases as high as 85 per cent in a year, and average more than a 50 per cent decline. Just now there is a rather intensive drilling campaign on by the major oil companies which practically control the field, and many new wells will be brought in in the next six months. However, I believe that this field will reach its peak of production before July 1 next at about 75,000 barrels per

California Production for July 1, 1927 As Estimated by Rufus J. Pilcher, Statistician for Richfield Oil Co.

Field	Production July 1926	Production Dec. 1, 1926	Estimated July, 1927
Coyote	16,607	16,200	15,500
Dominguez	20,951	20,228	20,500
Fullerton	17,040	22,000	22,000
Huntington Beach	43,732	86,000	65,000
Inglewood	46,504	40,801	35,000
Long Beach	106,143	94,900	80,000
Los Angeles-Salt Lake	1,842	1,800	1,800
Montebello	18,498	17,500	16,500
Richfield	14,388	18,000	20,000
Rosecrans	15,618	14,887	12,500
Santa Fe Springs	48,900	45,642	45,000
Seal Beach	.....	4,085	30,000
Torrance	28,208	27,951	25,000
Ventura-Newhall	6,007	6,000	6,000
Ventura Ave	43,025	58,455	60,000
Whittier	2,038	2,000	2,000
Belridge-Lost Hills	4,605	4,864	4,600
Coalinga	19,908	19,721	19,500
Elk Hills	33,948	34,216	35,000
Kern River	11,297	12,391	12,000
McKittrick	5,382	5,314	5,200
Midway-Sunset	93,964	93,360	93,000
Santa Maria	4,786	5,000	4,500
Wheeler Ridge	1,065	1,076	1,050
Summerland	129	130	125
Misc. (Newport & Watsonville)	86	231	200
	604,619	652,742	631,975
Shut In			
Colianga	15,990		
Coyote-La Habra	1,575		
Elk Hills	11,550		
Kern River	6,220		
Lost Hills-Belridge	3,890		
Midway-Sunset	7,320		
Santa Maria	6,350		
Total shut in as of June 1	52,895		

DESIGN-EQUIPMENT-ERECTION

The Flexibility of Our Organization and Resources Enables us to

Design Complete Refineries or Plant Equipment

Fabricate and Furnish Material From Our Own Plans or the Designs of Others

Erect Equipment of any Design or Manufacture

We solicit the opportunity of quoting on the design, furnishing or erection of the following:—

PIPE STILLS
FRACTIONATING TOWERS
SHELL STILLS
ECONOMIZERS & HEAT EXCHANGERS
BOILER AND POWER PLANTS
WAX PLANTS
FILTER HOUSES
TREATING PLANTS
GAS RECOVERY PLANTS
PIPING & EQUIPMENT INSTALLATIONS

ASSOCIATES

THE WIDDELL ENGINEERING CO.

Consulting Engineers

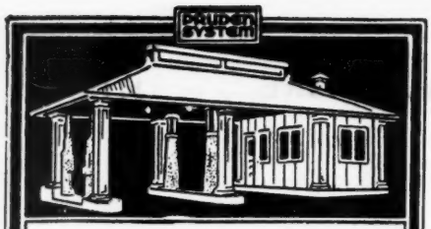
ARTHUR G. McKEE & CO.

Engineers and Contractors

KANSAS CITY
512 American Bank Bldg.

TULSA
935 Kennedy Bldg.

CLEVELAND
2422 Euclid Ave.



Copper-Alloy Galvanized Steel

has been proven by chemical tests and years of actual service tests to be the toughest, strongest, most rust-resistant building metal that scientific steel milling can produce.

It keeps in perfect, rustless condition for many years, without need of repair.

So Pruden System buildings are fabricated ENTIRELY of this material, in heavy grades. No wood is used at all.

There is a wide variety of styles of Pruden System buildings, some of which will exactly fill your requirements.

Ask for our circular.

The **METAL SHELTER Co**
WABASHA & WATER STS.
SAINT PAUL, MINN

Patent Pending

MORE OIL SALES

With oil displayed in this Rack holding 24 Dispensers. Has hinged caps covering each spout. All Bottle trays removable. The Neatest and Best Rack on the market.

Send for Particulars

WM. Neil & Co.
617 W. Division St. Chicago, Ill.

day, and by July 1 the production will not be in excess of 65,000 barrels per day.

Seal Beach is the newest of the flush fields and has already produced 10,000 barrels per day. I estimate that this field will be producing about 30,000 barrels per day by July 1, 1927. However, there is too little now known about the field to gauge its high production point. Several new developments would seem to extend the field considerably beyond the area to which a few months ago it seemed to be limited.

Two Old Fields May Come Up

OF the older fields there are at least two that may be expected to slightly raise their production the next six months. Richfield, due to recent development of the Kraemer sand, has increased its production the last six months some 4000 or 5000 barrels, and will perhaps increase it several thousand barrels more. I expect the field to do 20,000 barrels per day by July 1, 1927.

Fullerton has also increased its production a few thousand barrels during the last six months, by application of new deep drilling and production methods. This field should do 22,000 barrels by July 1, 1927. The production increase in these fields is, of course, not material but helps to offset the decline in some of the older fields, and in that way influences the production curve.

In an accompanying table I have detailed the estimate for the California fields as of July 1, 1927, whose aggregate, I believe, as I have previously stated, will be 631,975 barrels per day.

In an estimate of what is going to happen in California oil, even during a six-months' period, it is necessary always to consider the possibility of the discovery of a new oil field, which may upset the estimate. There is a lot of wildcatting going on all the time, and a new field was brought in during the year on the north of North Kern River Front. I have in mind the Poso Creek Field. This, however, to date has been very disappointing. Altho a large amount of leasing was done and numerous wells were drilled, there has been only about 1000 barrels per day of very low gravity oil produced.

The fact there is a large amount of this heavy commodity now shut in in California would seem to operate against extensive development of this area, even though it does develop into a better field than now appears, and I believe the drilling will not exceed the lease requirements at best.

New Field Opened at Cypress

SPEAKING of wildcats, it seems very probable that the Associated have discovered an oil field at Cypress, but this time is altogether too premature to hazard any guess as to what the field may produce. It is likely the lessees will be very conservative in opening up this field, granted there is one, in the light of the present situation.

In consideration of the future an important factor is the development of the deep sand at Inglewood, but here again it would seem it is not to the best interest of the oil industry to start something there that might upset the market. We may consider, however, I think, that there is a potential of from 40,000 to 60,000 barrels per day in this field, which would undoubtedly be brought to a peak over a 90-day drilling program.

There is also consideration of the shut-in production, which is now about 53,000 barrels per day of low gravity oil. Undoubtedly this will not be opened up until there is need for it, which I do not think will occur in 1927.

Besides the production there are several other major factors which have an important bearing on the oil situation. Of these the two fundamentals are consumption and storage. Continued increase in the consumption of all refinery products from year to year has done much to help out over-production. The large annual increase in the amount of gasoline used has been very fortunate.

Fuel Oil Is Accumulating

CONSUMPTION of other products, with the exception of fuel oil, has kept up with gasoline, but fuel oil is the crux of the situation now, and has had a most important influence on the market structure. The market on this commodity is now and has been for some time very soft, even though we have increased not only local consumption but export of this commodity very materially. It is no doubt true that few people outside of the oil industry realize that the refiner has much further to go than successful marketing of gasoline. He manifestly cannot make a success unless he gets rid of his important by-product, fuel oil, because therein may lie his whole margin of profit.

The situation for the past year with respect to the storage of light refinable crude has been very encouraging. The withdrawal from storage of this commodity has reduced stocks from 43,300,000 barrels in October, 1925, to 30,300,000 barrels in October, 1926. But during the same period heavy crude and fuel oil stock have increased from 84,400,000 to 88,500,000 barrels.

Although we have withdrawn from storage in California during the past year at the rate of over a million barrels a month, in October we put this refinable crude into storage; a small amount, it is true, but enough to make the difference between withdrawal and the addition of over a million barrels, and to change what has been a healthy situation into an unfavorable one.

The addition of refinable crude to storage, rather than its run to refineries or exportation out of the state, at this season of the year when consumption of gasoline is considerably lessened, is not good for the price structure.

Drop In Crude To Be Expected

Of course this discussion of the California oil situation leads up to but one really important point, and that is the condition of the market. Nothing else really matters.

Skelly Plant is Successfully Treating Panhandle Natural Gasoline

By J. C. Chatfield
N. P. N. Staff Writer

AMARILLO

AFTER extended experimental work, manufacturers of natural gasoline are solving the problem of the treatment of gasoline made from the extremely sour gas produced in the Panhandle oil fields. Research engineers now are extending their studies to methods of treating the gas itself to minimize corrosion of equipment used in handling the gas.

Gas produced in the Panhandle fields with the oil has a hydrogen sulfide content running up as high as 3 percent. Raw natural gasoline produced in the field likewise contains a high percentage of sulfur.

With a specially designed continuous treating system, Skelly Oil Co. is producing a doctor test, non-corrosive gasoline which does not go off color in storage or in transit. One treating system at Skelly's No. 5 plant handles all gasoline from the company's six plants in the Hutchinson county fields. This gasoline has been shipped as far north as Canada and as far south as the gulf without souring or changing color.

In brief the process used by Skelly consists of washing the sour gasoline with caustic soda before a final treatment with hypochlorite. The usual method of treatment, however, has been modified to meet special conditions encountered in this field.

The treating plant consists of four vertical tanks 5 by 20 feet connected in series, an orifice contacting system and two 980-gallon hypochlorite working tanks with a steam pump to circulate the hypochlorite solution. The first two tanks of the series are used for the caustic wash and the last two as hypochlorite settling tanks. A flow sheet of the system is given in Fig. 1.

Method of Operation

AN ingenious method of saving expense has been worked out in the caustic wash. Spent hypochlorite solution from which the chlorine content has been removed is used in the first of the four towers. The sour gasoline passes upward through this column of caustic being contacted intimately by passing through a series of tile baffles packed in the tower.

In the second caustic tank a 25 A.P.I. gravity solution of sodium hydroxide is used to remove the last trace of hydrogen sulfide from the sour gasoline. This second tower likewise is packed with tile. The chemical reaction in the first two towers may be stated by the following equation:

Technical staff of the Skelly Oil Co. at its Panhandle gasoline plant. From left to right, H. J. Ratti, research chemist, Gasoline Recovery Corp.; R. O. Campbell, research chemist, Skelly Oil Co.; E. K. Anderson, plant chemist; and C. R. Fentress, control tester.

$$Na\ O\ H + H_2S = Na\ H\ S + H_2O.$$

Between the second and third towers a six-plate orifice contactor has been inserted in the gasoline line. The hypochlorite is injected into the two-inch gasoline line from a one-inch line through a tee. The contactor is composed of four-inch flanged pipe into which six four-inch blind flanges have been introduced. Beneath each blind flange has been welded a two-foot section of two-inch pipe, capwelded at the end to close. In the circumference of this section of 2-inch pipe 72 holes have been drilled each ¼ inch in diameter. The total area of the 72 holes thus is equal to the area of the two-inch hole cut in the four-inch blind flange. As mentioned above, six of these contactors are placed in the four-inch line to assure an intimate mixture of hypochlorite solution and gasoline.

From the contactor the mixture of gasoline and hypochlorite passes to the bottom of the third tank where the hypochlorite settles out. A gauge glass in the bottom of this tower permits the operator to watch the level of the hypochlorite solution to see that a proper amount is being drawn off through a bottom outlet valve.

The fourth column is a secondary settling tank to make sure that all hypochlorite is settled out of the gasoline before it is pumped to storage. It is fitted also with a draw off line to return any accumulation of hypochlorite solution to the working tank.

Two Hypochlorite Tanks

THERE are two hypochlorite tanks connected at the top with the two settling tanks and at the bottom with the steam pump used to circulate the solution. With the aid of these two tanks it is possible to operate the system continuously.

With the usual mixing arrangement the solution is prepared and placed in one of the 980-gallon tanks and the steam pump started. As the solution is withdrawn by the pump and forced to the contractors the settled solution is withdrawn from the two final towers and drained by gravity into the working tank. The hypochlorite solution thus is kept in constant circulation as long as the gasoline leaving the system is sweet.

Near the end of the run the man in charge of the treating system is engaged constantly in sampling and testing with doctor solution. When he observes the first trace of cloud in his sample the treater quickly opens the valve between the steam pump and the second hypochlorite working tank and closes the valve from the No. 1 tank. The same is true of the upper valves in the gravity line from the settling towers.

When a tank of hypochlorite solution is exhausted the caustic remaining is pumped to the first caustic tower and used until the second hypochlorite tank is exhausted.

Steam Pump Used

WHEN the treating system was designed originally it was planned to use a centrifugal pump between the second and third towers to obtain contact between the hypochlorite solution and the gasoline. It was discovered that the contact gained by this method was

Professional Card Directory

RANNEY OIL MINING COMPANY

Leo Ranney, *President*

Oil Mine Engineers

26 Broadway New York City

W. FREDERICK SUENDER

Refinery Cost Accountant
Petroleum Economist
Statistician

247 PARK AVE. NEW YORK CITY

L. G. Huntley J. R. Wylie, Jr.
Shirley L. Mason

HUNTLEY & HUNTLEY

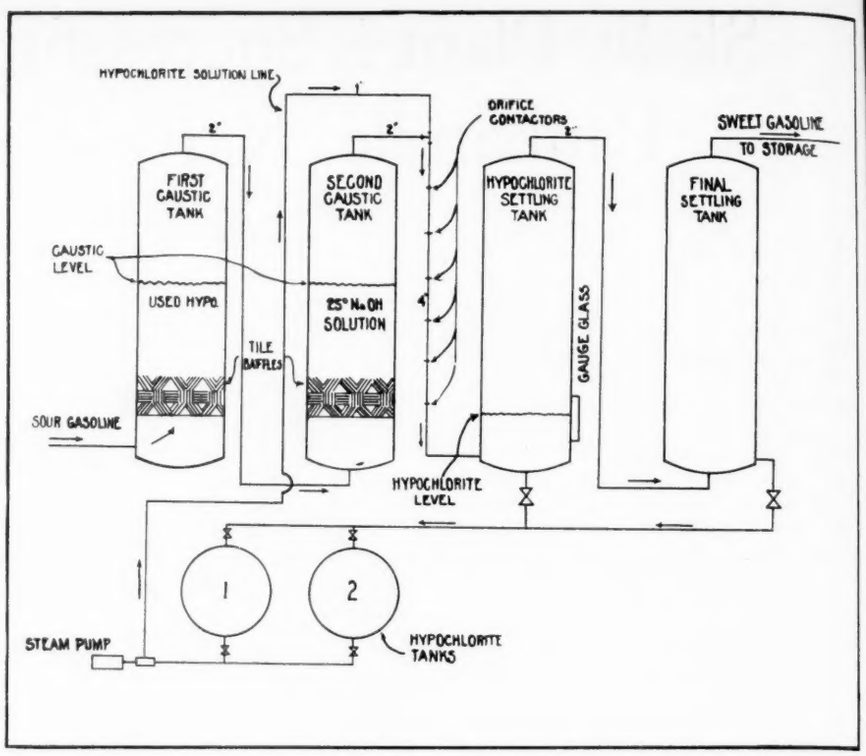
PETROLEUM GEOLOGISTS AND ENGINEERS

Frick Building PITTSBURGH, PA.

PROFESSIONAL advertising keeps your name constantly before the industry you are engaged in. When the readers of *National Petroleum News* want professional services they will naturally turn to this directory.

THE COST IS SMALL

Single insertion—$5 per column inch. A discount of 5% is allowed on 13 insertions if paid in advance.



Flow diagram of the treating system used by the Skelly Oil Co. at its natural gasoline plant in the Panhandle field.

not adequate for the type of gasoline produced in the Panhandle.

In place of the centrifugal, a 4½ by 3 by 4 iron-fitted Gardner steam pump was installed to handle the hypochlorite. The iron fittings were used to prevent corrosion since hypochlorite attacks brass very quickly.

Gasoline is pumped through the system at the rate of 8000 gallons every two hours and 15 minutes. The plant is able to handle at that rate about 10 cars per day.

By utilizing the spent hypochlorite solution as described above, the Skelly Oil Co. is enabled to keep its treating cost under a quarter of a cent per gallon for chemicals. Necessary overhead such as the interest on investment, depreciation and wages of treaters add somewhat to a final cost figure.

Following is a report of an average five-day test of the plant as actually operated by Skelly:

Gasoline to treating plant, 185,054 Gal.
Hypochlorite solution used, 5568 Gal.
Cost of solution used, $44.04.

Cost per 1000 gallons of gasoline treated $0.238.

The entire treating plant is enclosed in a steel building 36 by 46 by 30 feet. At one end of this building the chemical mixing tanks are raised on a platform supported by welded lengths of pipe. Completed mixtures drain by gravity from the platform to working tanks as required.

Texas Co. Loans Boat For Florida Relief Work

HOUSTON, Dec. 6.—The loan of its power boat "Dorothy" to the U. S. Coast Guard by The Texas Co. during relief work at Miami harbor after the recent hurricane which swept through Florida, brought forth the following letter of appreciation from T. S. Klinger, lieutenant commander of the "Yamacraw" of the U. S. Coast Guard:

"We wish to express to your company our appreciation for the use of your boat the 'Dorothy' during the relief work in Miami harbor. This boat was received from your Mr. Raynor on Sept. 24, 1926, and was used daily in removing wreckage from alongside various docks and in salvage operations on several small boats that had been sunk.

"The work of Mr. Brown, the operator of this boat, was most excellent. His attitude and ability to cooperate with others was responsible for the large amount of work accomplished by this boat.

"This boat was returned to your company on Oct. 2, 1926, and was the only boat that was offered and accepted that was in use throughout the entire time this ship was engaged in clearing up the harbor."

ONEIDA, N. Y.—E. H. Clayton who started in the oil jobbing business here on Jan. 1 of this year as distributor for The Deyo Oil Co., Inc., of Binghamton, N. Y., now has 25 dealers here, in Rome, Sherrill and Canastota and surrounding territory as his customers. The Deyo company is producer, refiner and marketer of Galtex Better gasoline and motor oil.

Last Week at the Free Oil Stations

By Oscar Crabbe

"OSCAR," said the editor of the National Petroleum News, flicking the ash off a 35 cent cigar, (he had just returned from a convention) "Oscar, I have been reading 'Last Night on WJBOR' reviewing the free radio performances. Does it suggest anything to you?"

"That I might do one on 'Last Night on my Ostermoor,'" said I, with my customary snappy comeback.

"That you might hop into one of the Rolls-Royces maintained by the office—take the green one—it is last year's model and I am ashamed of being seen out with it any longer—and review 'Last Week at the Free Oil Stations,'" said he.

So that was that, and this is this:

* * *

THE TexPenn Oil Company can always be depended upon to do the right thing by the public. The opening of its new service station at Fourth and Market streets was an event that will go down in the social history of Philadelphia alongside another famous flop, the Sesqui.

This station is reported to have cost in the aristocratic neighborhood of $75,000. It is early Renaissance, with just a dash of late Tulsa in its facade. The pumps are done in pea green with silver-plated handles, and there is an atomizer opposite the five-gallon mark which sprays Coty's Azur d'Obliviana over the driver as he reaches for his change pocket. The attendants wear morning coats until six p. m. when they shift to dinner coats. I think full dress should be required on Tuesdays and Thursdays.

For the opening night George Olsen's orchestra played, but this will not be a regular feature. The clarinettist was in excellent form and his rendition of the OLD HOKUM BUCKET was twice encored. The sax was not up to the usual Olsen standard, it seemed to me. At least he was not the equal of the soloist with Paul Whiteman's band at the opening of the Tybull station two blocks away last week. However, the ensemble was good, and little criticism was heard among the audience.

Instead of the usual carnations, the management of the TexPenn introduced a novelty in the way of souvenirs for the ladies by presenting each with a beautiful chrysanthemum. Far be it from me to appear captious but I could not but recall that at the opening of the Good Glup station a few days ago orchids were given to the fair sex.

A light collation was served, consisting of caviar on thin toast, cold meat, various kinds of salad, fruit punch and cigars. A new idea was shown in the distribution of oil. In place of the usual five-gallon can of oil with each gallon of gasoline sold, the management issued season tickets for all the oil a motorist wants for the rest of the year. A brisk market developed in these tickets afterwards, the opening price of $1.00 giving way under pressure until they sold at 39 cents. I understand that the management bought heavily on the decline in an effort to hold the market. At eleven o'clock, when the station closed, over $18.00 had been taken in.

* * *

THAT an even larger amount of cash business would have been done but for the simultaneous opening of the new Whozoil station at 15th and Franklin Streets goes without saying. Here, if ever, there was an urgent need for a new filling station. For as much as 200 feet in either direction there was previously no service station, and there were hitherto but three in the entire block. The management of the Whozoil deserves a great deal of credit for seeing this opening. It indicates that there is always a chance for an energetic operator to pick up good sites.

The new Whozoil station shows how far the oil business has progressed in recent years in meeting the public demand. It is done in white marble with pure Grecian columns. The driveways are rubber tiled, with felt buffers on the curb to ward off tires that otherwise might scrape the beautiful mosaic. This station was designed by Piatti and Anatoupalas, who have done some of the finest monuments in our leading cemeteries. Its completion was made possible by a recent bond issue which was taken by Wall Street at 65 and offered to the public at 101 and interest. Three workmen and ten supervisors were engaged upon this job for six months and the results are well worth it. The new station has been aptly compared to the Congressional Library and the Nedick Orangeade stands, both of which it resembles.

The opening of this new station reflected the same acumen which, exerted in other managerial directions, has resulted in making Whozoil stock sell from 78 to 23. Pound boxes of candy were given to the ladies and Neversharp pencils to the gentlemen. The catering was by the Ritz Carleton, and needless to say, was beyond cavil. It seemed to me, however, that those responsible showed questionable judgment in serving ices, owing to the coolness of the evening. The hot chocolate with whipped cream proved more popular.

The Whozoil people tried a daring expedient at this opening by limiting the amount of free oil to a gallon for every gallon of gasoline sold. The cans were done in cream enamel, the handle being wrapped in green silk ribbon. They made a very effective display. For those who were not willing to take the cans into their cars free delivery within 50 miles was provided.

* * *

ON the way back from inspecting these stations I dropped in for a moment at the Georgian brick service station opposite the public library opened last week by the Standup Oil Company. It will be recalled that 22,000 gallons of Pullerin were distributed to make this opening a success. The three operators, dressed in white uniforms that were still innocent of any petroleum stains, were playing cards inside. When I blew my horn one of them called out that they were not giving away any oil today.

"How are gas sales going?" I inquired.

"Don't make me laugh," said the head salesman. "Didn't I just tell you that we are not giving away oil today?"

Nine More Oil Burners Listed as Standard

CLEVELAND, Dec. 4.—Since last spring Underwriters' Laboratories, Chicago, have tested and listed as standard eight more domestic oil burners and one more industrial burner. These supplement a list of 52 burners previously approved which list was published in National Petroleum News for June 2, page 90. Additions to the domestic list are:

Summerheat Type S.—Beckwith Co., Dowagiac, Mich., Mechanical draft. Fuel: Not heavier than 32° A.P.I.

Field Type L.—Field Engineering Co., Chicago. Natural draft. Fuel: Kerosene or distillate not heavier than 36° A.P.I.

Bueger-Gulf Type 14-J.—Gulf Oil Burner Co., Pittsburgh. Natural draft. Fuel: Not heavier than 40° A.P.I.

Johnson Type 26-A.—S. T. Johnson Co., Oakland, Calif. Mechanical draft. Fuel: Not heavier than 28° A.P.I.

Paramount Type D.—Paramount Fuel Oil Burner, Inc., Bayside, Long Island, N. Y. Natural draft. Fuel: Distillate not heavier than 36° A.P.I.

Rayfield, Model L.—Rayfield Mfg. Co., Chicago. Mechanical draft. Fuel: Not heavier than 28° A.P.I.

Security Model S.—Security Stove & Mfg. Co., Kansas City., Mo. Mechanical draft. Fuel: Not heavier than 36° A.P.I.

Silent Automatic Model A.—Silent Automatic Corp., Detroit. Mechanical draft. Fuel: Not heavier than 36° A.P.I.

The newly listed industrial burner is:

May Type C.—May Oil Burner Corp., Baltimore. Mechanical draft. Fuel: Not heavier than 28° A.P.I.

Noted Geologist Dies

TULSA, Dec. 6.—Prof. James T. Kemp, 67, one of the most celebrated geologists in the United States, died Nov. 17. He was head of the department of geology of Columbia university. He was a resident of Tulsa for a short time about 10 years ago, when he was connected with the firm of Hager & Bates, consulting geologists.

Natural Soda "Drive" in Salt Creek May Be Aiding in Oil Recovery

By W. T. Thom, Jr.*
Geologist in Charge Geology of Fuels, U. S. Geological Survey

THE oil industry is deeply interested in the probability that improved methods of oil recovery will give commercial value to many old oil fields previously regarded as nearly exhausted, and will add greatly to the life and yield of newly discovered pools. Because of the newness of many recovery methods now being given a trial the respective value of these various methods is uncertain. It can be stated with confidence, however, that no single new method will apply to all oil fields, and that one must know the conditions obtaining in a specific field in order to select the new method which will give best results in that field.

That the movement of oil-field waters, if properly controlled, has a beneficial effect upon oil production is not yet universally recognized, and has in a measure been lost sight of since such general interest has been aroused in the value of natural gas as a prime factor in the recovery of oil. In some instances the helpful influence exerted by waters arises solely from their hydrostatic pressure and may be partly offset by chemical reactions between water and oil. In other instances the waters may be neutral chemically with respect to the oil, and in yet others the dissolved salts of edgewaters may actually aid water pressure in loosening oil from the sand and in increasing its recoverability. The purpose of this article is therefore partly to emphasize the value of natural or artificial edgewater movement (under suitable control) as an aid to oil recovery, and partly to describe edgewater conditions at Salt Creek, Wyo., which suggest that a direct relation exists there between the amount of sodium carbonate dissolved in the waters and their beneficial "water drive" effects.

That, under certain conditions, contained sodium salts in edgewater of an oil field may be of great assistance in increasing the final recovery of oil is the point made by the author in the accompanying paper. Specifically, he points to the Salt Creek field of Wyoming where such natural aid to recovery appears to be at work. The paper was presented at the October meeting of the Petroleum Division, American Institute of Mining and Metallurgical Engineers, in Tulsa and is published here as revised by the author by permission of the Institute.—Editor.

Four Major Types of Oil Pools

FOR practical purposes, oil accumulations may be grouped into four major categories, which consist, respectively, of

(1) Those fields which contain no important amounts of water and in which the expansive energy of gas is the force causing the migration of oil to the well. In these fields, methods of controlling pressures and of causing the gas to do maximum work in driving the oil are of major importance, and the reintroduction of gas or the employment of methods of water flooding as final stages in the fields' development may be highly beneficial. In fields of this class recoveries of 15 to 20 per cent of the original oil in the ground are probably the rule, except in so far as new recovery methods are applied.

(2) The second group of fields consists of such as yield oil both under the influence of gas pressure and of the hydrostatic pressure of encroaching edgewater. Where the sands of such fields are coarse-textured and open, as in many of the Wilcox sand pools of Oklahoma, one may be unable to see in the production curves the relative effects of gas and water pressure, whereas in other fields with lower sand permeability the decline of oil production incident to the depletion of the gas may be stopped, and a new wave of production may be induced, as the bank of oil moving in front of the encroaching edgewater comes within reach of outlet wells. In all fields of this class the application of back pressures may be particularly desirable, to avoid water coning and the trapping of bodies of oil. In those fields where the rate of water encroachment is slow, the artificial reintroduction of gas, and artificial water flooding, may both stimulate and expedite oil production if applied under proper controls.

(3) In the third type of field the hydrostatic pressure of water is practically the sole cause of oil production. The South Fields of Mexico and some of the Balcones Fault zone fields of Texas are familiar examples of fields of this type. The completeness of extraction in these fields depends in considerable measure upon the slope of the oil-bearing sands and upon the specific gravity of the edgewaters, or upon the temperature of the waters associated with the oil. Edgewaters which have a temperature near the boiling point, such as those which occur at Grosny, Russia, are, because of their high temperatures, probably very effective agents in cleansing the oil sands, and recoveries under such conditions may be practically complete (assuming that wells are so handled that no by-passing takes place and that no bodies of oil are trapped in the areas between wells). With steep dips and dense brines such as occur in productive areas on the flanks of many salt domes, the water tends strongly to lift the oil, because of its buoyancy, and may cause a comparatively complete recovery of the oil from the containing sand.

(4) In the fourth type of pool the oil which occurs is under no pressure, and such yields of oil as are obtained under the influence of gravity are small, and commonly are of less than commercial amount, even though the actual body of oil present be of large magnitude. Sands containing such low pressure oil are well worth considering, either for mining or for gas or for water flooding, and it is entirely possible that fields of this class may in the future yield a large part of our oil production, after oil producers have become convinced that the coring of all oil-bearing formations is important, and that such coring may show that supposedly dry holes have penetrated commercially valuable bodies of oil.

Edgewater Conditions at Salt Creek, Wyoming

THIS preliminary statement has been offered to afford a background by which the significance of conditions prevailing in the Salt Creek field may be estimated. Thanks to a paper by Nowells, in the Bulletin of the American Association of Petroleum Geologists, and to papers presented before the American Institute of Mining and Metallurgical Engineers by Estabrook and Rader, and by Young and Estabrook, the productive history of the Salt Creek field, and the nature of the edgewaters in the main productive sands are well known. As shown by Wegemann in Bulletin 670 of the United States Geological Survey, the accumulation of oil in the Salt Creek field has been controlled by a strong domal uplift, and the principal production of the field has come from the Upper Cretaceous First and Second Wall Creek sands, in which the oil is surrounded by edgewaters under pressure. Wells beyond the edgewater line in the First Wall Creek sand

*Published by permission of the Director, U. S. Geological Survey.

commonly give artesian flows, whereas the pressures in the Second Wall Creek sand seem to be irregular and slightly lower, and in a number of marginal wells the water does not rise entirely to the surface.

According to Young and Estabrook, the waters of the First Wall Creek sand contain from 2500 to 16,000 parts per million of dissolved salts, predominantly sodium bicarbonate, with minor quantities of sodium chloride, and from 0 to 700 parts per million of sodium carbonate. In the Second Wall Creek sand the average concentration of the edgewater is considerably above that in the First sand and ranges up to about 20,000 parts per million of dissolved solids, which consist chiefly of sodium bicarbonate, though with a relatively greater proportion of sodium chloride and with relatively much less sodium carbonate than is found in First Wall Creek water. Practically no calcium, magnesium, or sulphate is found in these waters.

The water in the First Wall Creek sand has encroached appreciably during the course of oil production, and this encroachment has either caused numerous wells to increase their yield of oil as the water approached, or has caused edge wells to show a much more sustained production than such others as have produced only under the influence of gas pressure. In contrast with this condition in the First sand, edgewater in the Second sand has encroached but little and, perhaps, due to this restricted encroachment, the rock pressure in the Second sand has declined much more rapidly than in the First.

Relation, Carbonate Waters to Encroachment

TAKING into consideration, as well as one may, all such factors as composition and thickness of the sands, their porosity, yield, etc., there seems to be a possibility, and even a probability, that the difference in edgewater movement in the two sands is partly due to the difference in the chemical character of the two waters—and that even the presence of a few hundred parts per million of sodium-carbonate in these edgewaters has perceptibly reduced the tendency toward formation of emulsified oil and has increased the "driving" power of the edgewater. In a letter to the writer, Ray O. Armstrong, for a number of years in charge of the Salt Creek office of the Bureau of Mines and of the Geological Survey, made the following statement:

"I believe there is some evidence indicating a difference of effect upon production by carbonate waters, as compared to chloride waters. Generalized, the points bearing on this matter are as follows:

"(1) Encroachment has been more rapid in the First Wall Creek sand than in the Second.

"(2) Pressures have been maintained at a higher level in the First Wall Creek sand than in the Second.

"(3) Edge-wells in the First Wall Creek sand cause less trouble due to emulsification than do edge-wells in the Second Wall Creek sand. That is, the Second Wall Creek water appearing in wells cause a greater emulsion problem than does the First Wall Creek water. The First Wall Creek water can be steamed clean with ease. The Second Wall Creek water steams clean with difficulty and causes a greater loss through emulsion than does the First Wall Creek water.

"(4) In the southwestern, south, and southeastern portion of the Second Wall Creek sand area, including the saddle between Salt Creek and Teapot, all Second Wall Creek waters are high in chloride content and comparatively low in carbonate content. In these parts of the field water has shown in some producing wells for more than two years, although not more than two wells have been abandoned because of water encroachment, the encroachment having been very slow and the actual amount of water very small. Moreover, rather high percentages of emulsion precede the appearance of water in this area and remain to a considerable extent after the appearance of water.

"(5) On the western edge of the Second sand area, beginning at sec. 3, and extending northward through sec. 22, all Second sand waters so far found have shown a concentration in total solids equivalent to the concentration in other parts of the field, but have shown a larger amount of carbonate and a smaller amount of chlorides. In fact, the reacting percentages of carbonate, plus bicarbonate, and of chloride in waters along this area are very similar to the reacting percentages of the same radicals in the average First sand water, and along this same area, extending from the north part of sec. 3, through sec. 22, water encroachment in the Second Wall Creek sand has been structurally much higher than in other parts of the field, where lower carbonate concentrations obtain."

That the sodium carbonate present in the First Wall Creek edgewaters at Salt Creek has the effect of freeing the oil from the sand grains and increasing recoveries seems probable in the light of experimental work done in the laboratories of the Geological Survey on the geochemical relations of carbonate solution and oil-soaked sands. According to laboratory experiments conducted by Dr. P. G. Nutting, fresh water does not cause a complete flushing of oil from sand, each sand grain retaining a film of oil even after the sand has been flooded with water. In contrast to this flushing with fresh water, it was found that when a siliceous (acid) sand was flooded with an alkaline solution (such as that of sodium carbonate), or when a feldspathic (alkaline) sand was flooded with an acid solution, the oil was completely released from the sand and a practically complete extraction of oil was made possible. On the strength of this experiment, operators in the Bradford field introduced soda into a number of flood wells and the results so far obtained are encouraging as to the beneficial action of the soda, though regarded by the writer as not yet thoroughly conclusive.

Results of Flooding at Bradford

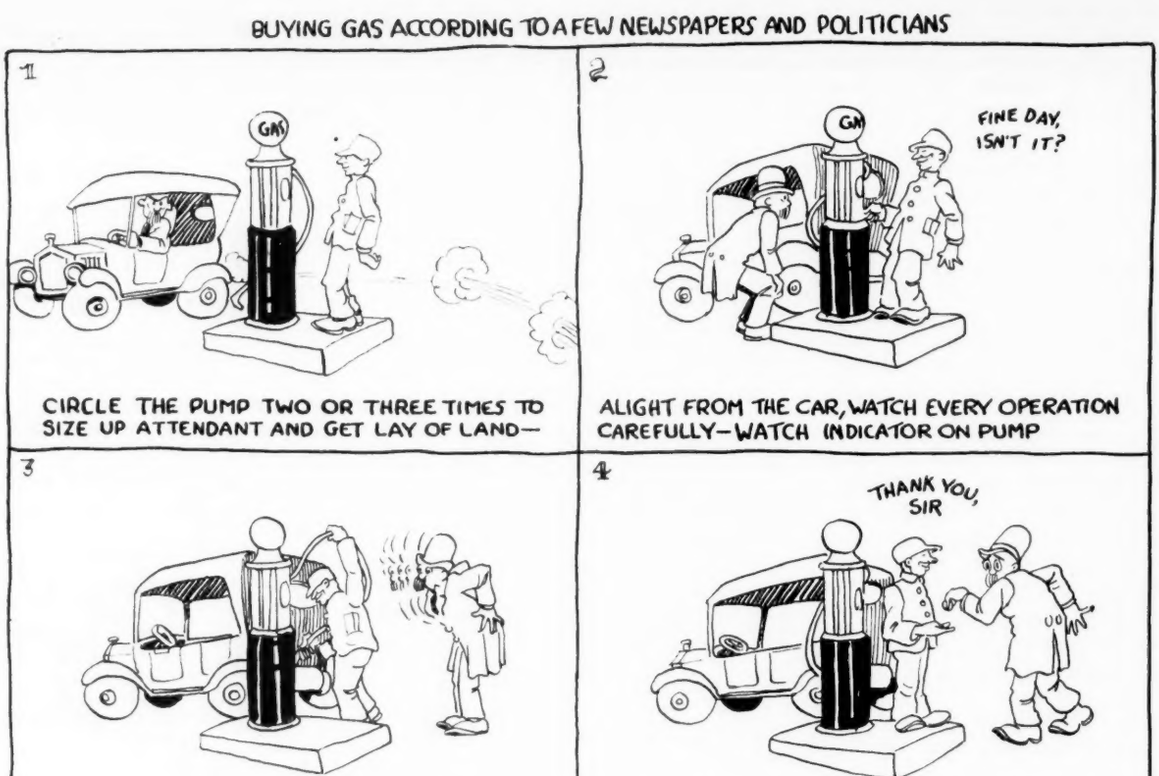
THE Bradford field is one in which no extensive encroachment of edgewater has taken place and according to a paper by J. B. Umpleby, president of the Petroleum Reclamation Co., presented before the American Institute of Mining and Metallurgical Engineers, the average recovery from the Bradford field by flowing and pumping over a period of 50 years amounted to about 3000 barrels an acre. Since the systematic application of water flooding, yields ranging up to as much as 13,000 barrels an acre have been obtained within a period of three years, and there now seems to be the further likelihood that the yield obtainable by ordinary water flooding methods may be further increased by the addition of soda to the flood waters.

Significance of Flood Experiments

WHAT the precise significance of the Bradford experiment may be, in terms of increased production in other parts of the United States, can not be stated positively at this time. However, if properly controlled, water flooding may ultimately bring great additional yields from all fields where no great water encroachment is taking place, and even the "tight sand areas" such as those on the edge of the Burbank field may yield commercial oil when gas or water flooding is applied to them. Whether plain water or soda solution will be generally effective as flooding agents can not yet be predicted. That the soda solution may give good results in many fields where flooding can be applied, seems to be reasonably probable; that it will not result disastrously in fields which contain large quantities of calcium or magnesium chlorides in the sands, remains to be demonstrated; and that the sodium carbonate will be as effective when mingled with certain types of oil-field waters, as it is in a simple solution, seems uncertain, from what has been said regarding water conditions at Salt Creek.

Water Must Be Controlled

IN conclusion one may say that water in an oil field, like fire, must be kept within bounds if disaster is to be avoided. Carefully controlled water flooding, whether with or without soda, and with or without contemporaneous application of gas pressures, is a method which will undoubtedly increase oil recoveries from many fields, as the yields of oil obtainable from the energy of original dissolved gas are probably seldom above 25 per cent of the oil in the ground, and in the past have, according to many technical men, averaged less than 20 per cent, whereas recoveries under water pressure, so controlled as to avoid trapping of oil, may


BUYING GAS ACCORDING TO A FEW NEWSPAPERS AND POLITICIANS
1
GAS
CIRCLE THE PUMP TWO OR THREE TIMES TO SIZE UP ATTENDANT AND GET LAY OF LAND—
2
GAS
FINE DAY, ISN'T IT?
ALIGHT FROM THE CAR, WATCH EVERY OPERATION CAREFULLY—WATCH INDICATOR ON PUMP
3
WATCH THE DRAINING OF THE HOSE—THE ATTENDANT SOMETIMES SLIPS A DROP IN HIS POCKET—
4
THANK YOU, SIR
HAVE EXACT CHANGE AND BE READY TO DASH AWAY BEFORE ANYTHING OCCURS
SEDGWICK

amount to as much as one-half of the original oil content of the sand. That soda solution may often be superior to plain water for flooding purposes, and may give an even higher percentage recovery, appears probable on theoretical grounds and on the basis of experiments so far conducted, and is also suggested by the Salt Creek conditions described above. It must, however, be remembered that no flooding method can be safely applied without competent geological and engineering supervision, and without adequate means for observing and recording the results obtained in the course of the work.

Operators who decide to try the use of soda flooding should do so with the realization that it is possible that under some conditions the sodium carbonate may be harmful, by causing deposition of lime carbonate; and that it will hardly be worth while to make the experiment unless it is to be done carefully, under the supervision of trained engineers and geologists, and with a carefully planned system for collecting and recording a whole series of facts regarding structural, water, and sand conditions in the field studied; the character of the oil; the rate of movement of oil, gas, and water in various directions through the sand; the rate of yield of oil and water from individual wells both before and after flooding was started; and the rate at which soda solution, of known strength, is being introduced in inlet wells.

The structure of both the top and the bottom of the sand needs to be worked out with great care and accuracy, as very slight arches or depressions in the sand surfaces may exercise a notable influence in determining the direction of underground flow. The thickness, composition, bedding, porosity, and saturation of the sand need to be accurately known, requiring careful coring, and study of cores and drill cuttings. The nature and distribution of waters and water-soluble salts naturally associated with the oil will need to be determined. Also the character of the oil and gas present, and the changes in their character during the life of a well should be known. The rate and direction of fluid movement through the sand need to be determined: (1) by the use of coloring material, such as fluorescein, which can be added to flood waters; (2) by drawing lines of equal fluid discharges, based upon the production figures for a group of wells; or (3) by applying compressed air to an inlet well and noting the time of its appearance at surrounding outlet wells. If an oil sand contains considerable amounts of magnesium or calcium chloride the tendency of the sodium carbonate to react with those chlorides and plug the pores of the sand may be corrected by starting the flow with plain water, thus largely removing the troublesome salts before the approach of the soda flood.

In freeing the oil from the sand grains the soda solution is drawn forward by capillary forces and it is therefore necessary to have a water column in the inlet wells, only of a height sufficient to maintain the water supply behind the solution as it creeps forward over the sand grains, freeing the oil as it goes. Too great a pressure will force water through porous streaks and necessitate the lifting of a needlessly large amount of water. Too low a pressure will needlessly retard the operation of the soda and defer the recovery of the oil. Each field will present its own special conditions and at least until the major principles governing the applicability of the soda flooding method have been worked out the operators in a field will find that far more is to be gained than lost by uniting in the testing of the method, as is being done at Bradford.

BARBERTON, O.—A big electric sign, plenty of lights, neat drive-ways, flowers and cheerful service, have helped to attract trade at the No. 2 service station of The Barberton Oil Co. built last spring, according to B. B. Murphy, president. The station is equipped with Alemite lubrication system, which has increased the company's grease business. Roads around Barberton are in good condition and tourists to Columbus and Cleveland find the route through Barberton convenient, Mr. Murphy states.

SPOKANE, WASH.—The Standard Oil Co. of California has leased its service station on Havermale Island, Spokane, to Mr. Resor of the Coeur d'Alene garage. Mr. Resor is remodeling the station and will handle Standard products.

The Editors' Viewpoint

National Petroleum News

Comment on Oil Resources

HERE is comment on the Government Oil Conservation report by the Conservative American Review of Reviews in their October number.

"While a careful reading of the report and a comparison of the findings of the four secretaries with the estimates made by the committee appointed by the American Petroleum Institute do not justify the alarming headlines in the newspapers which were used in presenting the results of this last investigation—the facts brought out do give food for some sober thought. This report puts the total present oil reserves in proven grounds at 4,500,000,000 barrels. Last year the United States produced more than 750,000,000 barrels, and so, theoretically, there is only six years' supply in sight. In practice, of course, the 4,500,000,000 barrels could not be gotten out of the ground in six years, and also there will be, within that time, new discoveries of oil fields and new methods of getting and saving more oil from a given field.

"In fact, many of the most seasoned and experienced practical oil men scout the idea of there being any danger of a shortage at all; they have lived long lives, always seeing new fields brought in to take the place of those that are going out and to take care of increased consumption. But there is no getting around the fact that each year there is less oil left under the earth's surface than there was the year before; and as no one knows how much remains of a commodity without which modern industry simply could not function, these figures from the Oil Conservation Board become very impressive."

Further on in speaking of fuel oil, the editorial comment is:

"We could do without oil as a fuel, because we have other things to burn, but we could not do without oil as a lubricant—the wheels of industry could stop—and we could scarcely keep up our present industrial civilization without gasoline for automotive engines."

What Is Anti-Knock Fuel?

A READER writes to suggest that refiner and distributor state just what the ingredients are of the various high compression fuels offered. He mentions specifically, Ethyl gas, No-Nox and Hi Compression. He says:

"The advantages of a proper anti-knock fuel are unquestioned. But our thought is that the consumer has a right to KNOW WHAT HE IS BUYING" (the capitals are his). He then goes on to say:

"To sum up: Is it fair to the consumer to ask him to buy 'a pig in a poke,' and, in the case of Ethyl gas, should not the quite general belief as to its being injurious to the motor be controverted if that can be done?" The correspondent writes that he makes these suggestions purely as a motorist, not as an oil man.

Our idea is that it would be impossible to let the motorist know, in the case of an anti-knock fuel, just what he is buying. Suppose every pump dispensing Ethyl gas bore a placard on which the chemical composition of Ethyl fluid was printed. It would state such and such a percentage of lead, so much ethylene dibromide and so on. Having read that, which would be the only possible way of stating the contents of the compound, would the average motorist really be any nearer knowing what he was buying than he is now?

Suppose the manufacturers of No-Nox, Hi Compression and the others stated on every pump that their fuel contained so much paraffins, so much aromatics, so much unsaturated compounds, would the average motorist be any the wiser?

As for the possibility of injuring the automobile engine, it would seem that the big reputable companies that are putting out anti-knock fuels, would certainly not scatter over their wide flung marketing territories, a fuel that would send their customers' cars to the repair shops. In fact, they all give assurance that their fuels are not harmful.

It seems to me that the motorist will have to go on, just as he has in the past, buying anti-knock fuel that he finds to be satisfactory in his car from companies he has found to be reliable and trustworthy and let the oil companies worry about what is in it. Does the average motorist know exactly what is in the ordinary gasoline he buys? And yet there are mighty few motorists that have any trouble with it if they buy from reputable companies. Doesn't it stand to reason that such oil companies will do just as good a job in furnishing anti-knock fuels as they have in furnishing ordinary gasoline?

Does anybody know every thing that is in the milk he buys, the butter, the ketchup, the bread? No, he buys these from dealers he feels he can trust and lets it go at that. We buy pretty much everything on faith and confidence. Why not anti-knock gasoline?—P. T.

Mexico Has Benefitted

OUT of every three dollars received for oil by oil companies operating in Mexico, at least two of them stayed in that country, is the statement made by the Standard Oil Company of New Jersey, on behalf of its Mexican subsidiary, the Transcontinental, in the current issue of THE LAMP, the company's house organ. It points out that one of those dollars was paid to Mexico for taxes and the other for labor. The company rightfully argues that, in the sub-division of the proceeds for the sale of Mexican oil, no one can challenge the statement that Mexico and its people have been fairly dealt with by American oil companies.

It is hard to realize the tremendous investment necessary for foreign oil operations. While Mexico is relatively an easier operating country than South America is proving to be, nevertheless, it called for untold millions of dollars, a great many of which had to be spent before a barrel of oil could be taken out of the country.

The Standard of New Jersey argues that oil companies are not peddlers with wares on their backs, who exchange glass beads for gold nuggets and then get away before the deception is discovered by the unfortunate customers. They have dealt with their foreign customers and with foreign governments with a view to the permanences of their relations. American oil companies have invested too many millions in Mexico to do it on any shoe-string or fraudulent basis. When the facts are known the American, and foreign oil companies, too, will be voted thanks for their fair treatment of foreign countries by those who are now condemning them.—W. C. P.

ZERO COLD TEST GEAR LUBRICANT

a product of

TRADE MARK

FISKE'S

A HIGHLY developed—reasonably priced transmission and differential lubricant—operates easily with temperature *below zero*—a dark plastic lubricant designed to meet general conditions of automotive transmissions—will not harden in cold weather—thoroughly coats gears and *will not channel*—this is the ideal all season lubricant—keeps its consistency in all temperatures.

Packed in 400, 200, and 100 pound drums, also all size cans—200 and 400 pound drums are equipped with special 2″ opening to handle pump.

We manufacture a full line of Lubricating Greases and Specialties.

Wire us for samples and prices.

FISKE BROTHERS REFINING CO.

24 State Street, New York, N. Y.

NEWARK, N. J. *Works* TOLEDO, OHIO

NIAGARA METERS WINTER-PROOF

Winter brings no meter troubles to the company using Niagara Meters. Outdoor locations in zero temperatures, snow and sleet beating on the meter have no effect.

Niagara Meters are built with heavy iron cases, zinc coated. The register case is rain and snow-proof. Meter construction is of metal thruout.

Write us today for prices.

BUFFALO METER COMPANY

2889 Main Street **Buffalo, N. Y.**

N. P. A. Fire Marshals Meet in January

CLEVELAND, Dec. 2.—The Association of Fire Marshals of the National Petroleum Association will meet early in January in Pittsburgh to hear what has been done toward fire prevention in the last year and to develop ways and means of reducing the number of fires in the future. Announcement of the January meeting, the exact dates to be set later, was made by R. A. Wotowitch, trustee in charge of the department of welfare, insurance, and fire prevention.

Mr. Wotowitch has sent a questionnaire to members of the N. P. A. containing these questions: "Have you a fire marshal?"; "Has he properly organized all of the men so that the best results may be obtained?"; "Are daily inspections made?"; "Are reports made regularly?"; "Is your fire fighting equipment in proper condition and regularly inspected?", and "Will your fire marshal attend the meeting in January, 1927?"

* * *

WARREN, PA., Dec. 2.—The fire marshals of the National Petroleum Association at refineries around Warren have decided to inspect the refineries there every Saturday afternoon. A whole afternoon will be devoted to each refinery.

The group made its first inspection two weeks ago. Every fire marshal was invited to tell frankly what he saw and the executives of that particular plant said that they were surprised at all the things that were seen and which had escaped the notice of their own men. The company's executives at Warren expressed themselves as pleased with this departure of the fire marshals.

Opens Another Service Station

BISHOPVILLE, S. C.—One of the most complete and attractive service stations in this part of the state was opened in October in this town of 3000 inhabitants by DesChamps Bros., Inc., dealers in gasoline, oil and automobile tires and accessories, according to Frank J. DesChamps, president. The station is of face brick, has three plate glass windows and two rest rooms. It is equipped with three 10-gallon visible pumps, and can furnish battery, electrical and tire services.

Havoline motor oil is handled exclusively at this station. This is the third service station of this company, which also has an accessory store.

The company sells 250,000 gallons of Independent gasoline yearly, and besides Havoline, handles Mobiloil and Sinclair motor oil.

Frank J. DesChamps is president and treasurer and Claude B. DesChamps is vice president and secretary.

Thick Walled Equipment is Only Answer To Refinery Corrosion Problem

By Dr. H. Schmidt, Berlin

Translated by Paul Truesdell from Petroleum Zeitschrift, Oct. 20, 1926 Issue

IN the distillation operations of the oil industry very often great destruction in the equipment occurs from corrosion. The industry has been fighting this corrosion problem for years with more or less success. In direct distillation, the greatest damage is observed in the places most exposed to temperature and especially in the air cooled condensers which are most generally used.

This corrosion is caused by the attack of sulfur compounds and above all others, hydrogen sulfide. In table 1, the comparative corroding influence on different metals and metal alloys as obtained in a long series of experiments is shown.

In the refining of crude oil with steam, one works at relatively low temperatures; for this reason the sulfur compounds which are so destructive are formed only in small measure. Consequently the corrosion in this process is less, although it is always noticeable. Corrosion in this process is chiefly caused by the magnesium chloride which is present in the salt water that accompanies the crude oil. At high temperatures hydrochloric acid is split off and attacks the metal. At the prevailing temperatures, the hydrochloric acid is inactive but in solution in the condenser water it causes enormous damage. This damage occurs especially in the condenser towers. The corrosion is also observed in directly fired stills in which the magnesium chloride and also the hydrochloric acid are released. Searching investigation has proved that the concentration of hydrochloric acid in both distillation methods is about the same. Water absorbs not only the hydrochloric acid but also hydrogen sulfide from the last fractions of the crude oil and this acid solution causes the great corrosion.

Table 1

Metal	Loss in mg. per sq. cm. 53 days	32 days	25 days	Average per day
Iron, Nickel, Chromium, Aluminum Alloy	0.015	...	...	0.015
Block Tin	0.064	...	...	0.064
Cyclop metal (raw)	0.069	...	...	0.069
Cyclop metal (pol'ed)	0.086	...	...	0.086
Rust Free Steel	0.096	0.119	0.152	0.112
Gunmetal	...	0.213	0.157	0.184
Manganese bronze	...	0.190	0.324	0.251
Trade bronze	...	0.290	0.247	0.271
Nickel bronze	0.279	0.370	0.189	0.285
Tin Aluminum-Bronze Alloy	...	0.137	0.600	0.310
Brass	0.421	0.481	0.154	0.378
Monel metal	0.333	0.475	0.425	0.396
Aluminum	0.582	0.506	0.194	0.471
Vanadium bronze	...	0.343	0.820	0.554
Copper	0.776	...	...	0.776
Calorized iron	0.814	...	...	0.814
Everdur metal	...	1.030	...	1.030
Cast iron	1.890	0.506	0.970	1.280
Copper bearing steel	2.010	1.340	1.980	1.970

Corrosion Bothers Germans

The accompanying article shows that the problems of corrosion in oil refineries are as troublesome in Germany as they are in this country. We are often led to believe that the technologists of Europe are far ahead of us in the solution of scientific problems. If this article presents a fair picture of the state of the art in Germany in regard to refinery corrosion, it seems that we are considerably ahead of them.

The table accompanying this article, in which rate of destruction of metals and alloys by corrosion is shown, uses some of the identical materials tested by Wilson and Bahlke at the Standard of Indiana's Whiting plant. The results of these tests of Wilson and Bahlke were published in National Petroleum News in June and July, 1925.

The figures used in this German article correspond exactly with Wilson and Bahlke's figures, even to the three periods of exposure. And Wilson and Bahlke tested a great many more materials than are reported on by Schmidt.

From all observations, unfortunately, the only conclusion to be drawn is that up to date no practical corrosion-resisting material for this kind of distillation equipment has been found. All of the metals used show more or less damage as the above table shows. The alloys used in the experiments as for instance iron, nickel, chromium, aluminum, or the Cyclop metal or the rust free steel, were of the ordinary composition used in the trade which composition is shown in the following table.[1]

Table 2

Alloy	Metal	Contents Per Cent
Fe-Ni-Cr-Al	Iron	56.60
	Nickel	31.89
	Chromium	4.34
	Aluminum	6.93
	Carbon, etc.	0.24
Cyclop metal	Nickel	18.
	Chromium	8.
	Iron	rest
Rust Free Steel	Carbon	0.30
	Chromium	13.
	Iron	rest

From the experiments it appeared that all the metals that stood up well against acid corrosion were less resistant to hydrogen sulfide. In general it can be said that Cyclop metal, rust-free steel, nickel, chrome steel and block tin as well as several bronzes were relatively corrosion-proof, while several kinds of wrought iron or steel were more rapidly attacked. Brass, Monel metal, aluminum, iron and cast iron hold a middle position.

In the following table, are assembled the results of tests made in metal samples taken out of a condenser.

Metal	Loss Mg. Per Sq. Cm. Per Day
Chromium Steel (raw)	...
Chromium Steel (polished)	0.0040
Aluminum	0.0216
Brass	0.0515
Cast Iron	0.2400
Nickel	1.6700
Trade Bronze	2.4900
Phosphor Bronze	4.8600
Manganese Bronze	0.0945
Vanadium Bronze	0.1100
Aluminum Bronze	0.1470
Monel metal	0.2220
Copper Bearing Steel	0.4150
Gunmetal	1.9600
Nickel Bronze	4.8600
Rust Free Steel	0.0254

In this table it is plainly shown that rust free steel, chromium steels as well as aluminum are particularly resistant. Also several bronzes belong in this classification. Corrosion was extraordinarily great in the alloys containing much copper or nickel.

The use of ammonia is proposed for the prevention of corrosion in crude oil distillation because it immediately neutralizes the thrown down acids.

Corrosion in cracking installations, is always a source of expense and danger. This corrosion can almost always be traced to the presence of sulfur compounds.

The attack of hydrogen sulfide is especially strong at high temperatures and 371 C. can be taken as the critical temperature, while at around 260 C. the activity is very much less. There are cases in practice in which condenser towers within two years have been entirely eaten up. On the basis of years of observation it seems best to build the walls of the apparatus strong enough to make sure the plates will stand for several years against the corrosion. This applies to large equipment and not to small parts. In the following table the corrosion of different metals is set forth in connection with the number of distillation carried out in them.

Metal	Loss in Mg. per Sq. Cm.	No. of Distillation
Aluminum	...	...
Rust free steel	...	...
Galvanized iron	0.55	50

1. Ind. Eng. Chem. Vol. 17 No. 4 (1925).

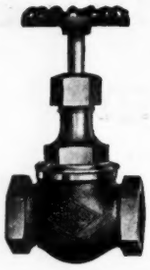


Fig. 106

Screwed, Jenkins Standard Bronze Globe Valve

Fig. 325

Screwed, Jenkins Standard Iron Body Gate Valve

"Jenkins throughout" lowers plant maintenance

An installation of "Jenkins throughout" means savings in time, because the need for frequent repairs is eliminated. It means fewer interruptions in production for the same reason. It means savings in actual cash expenditures by reducing to practically nothing the number of valves and valve parts needed for replacements.

Only genuine Jenkins Valves can give genuine Jenkins service. And each genuine Jenkins is marked with the Jenkins "Diamond."

At supply houses everywhere.

JENKINS BROS.

80 White Street.....New York, N. Y.
524 Atlantic Avenue.....Boston, Mass.
133 No. Seventh Street.....Philadelphia, Pa.
646 Washington Boulevard.....Chicago, Ill.

JENKINS BROS., Limited
Montreal, Canada *London, England*

Always marked with the "Diamond"
Jenkins Valves
SINCE 1864

Concerning your gasoline recovery plant on your refinery gases:

Are your pressures on your lean gases during absorption high enough to get complete recovery at minimum cost?

Are you pulling too much vacuum and thereby crediting your recovery system with condenser gasoline?

Do you appreciate that a bubble type absorber with some recycling gives high efficiency?

We have made a special study of these and other points.

We build gasoline recovery plants and overhaul some existing ones.

G. A. Burrell Company

Chemical Engineers

Columbia Bank Bldg. **Pittsburgh, Pa.**

Vogt Products For The Oil Refiners

We manufacture Paraffine Wax Presses, Distillate Chilling Machines, Stills, Auto Truck Tanks, Special Refinery Equipment, Boilers, Refrigerating Machinery, Drop Forged Steel Valves, and Fittings.

Bulletins On Request.

Henry Vogt Machine Co.
Incorporated
Louisville - - - Kentucky

Branch Offices
New York Chicago
Philadelphia Dallas

Zinc	0.60	10
Copper bearing steel	3.49	10
Chromium steel	3.68	20
Monelmetal	3.85	10
Bronze	19.25	10
Brass	21.80	10
Copper	40.60	10

To determine the extent of the corrosion produced by hydrogen sulfide, measured quantity of this gas was led through an iron pipe. In the apparatus used for this test, one is enabled to hold closely any desired temperature.

The gas leaving the end of the pipe is led into sodium hydroxide and the remaining gas measured by means of a burette. By this method a quantity of hydrogen set free by the reaction of hydrogen sulfide with iron can be calculated. Experiments at around 69° C. or 204° C. showed no appreciable reaction.

In another experiment the pipe was carefully cleaned with acid to start with, washed and dried and at 393.3 C. was subjected to another treatment with hydrogen sulfide. Study of the result of this experiment gives the impression that the deposit of iron sulfide acts to restrict corrosion although it does not hinder it entirely. Through the heating and cooling, parts of this coating formed by sulfide are broken down and thereby offering the possibility of further corrosion.

Steel Derrick Withstands Fire

CLEVELAND.—A fire at a well in the South Mountain field in Ventura county, Calif., left the steel derrick of the International Derrick & Equipment Co. standing and intact, with the exception of a few girts and braces being warped although the base of the derrick had become red hot at times from the intense heat. Repairs to the derrick were made and drilling started again within six days. This according to a letter from the Aitkin-Kynelt Co., Philadelphia.

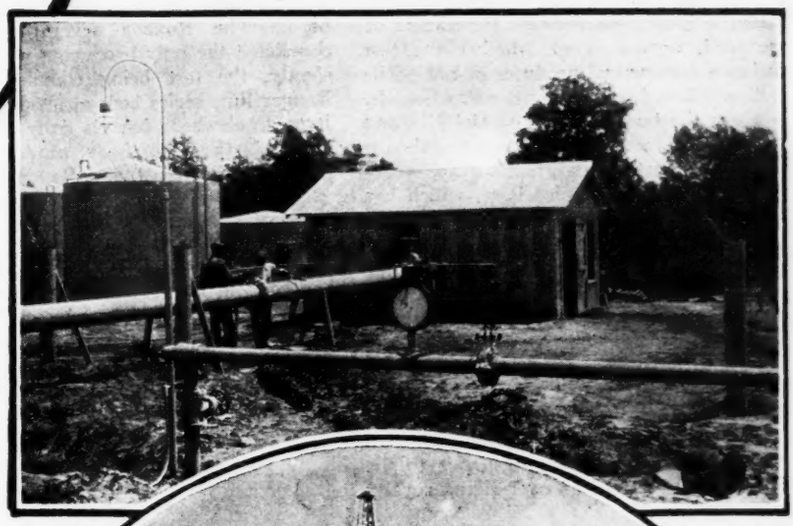
The fire was caused by the gas igniting in the cellar under the rig through an unexpected flow of gas and oil from the well. It lasted a little over two hours and due to the fact that the well was equipped with a steel derrick with steam snuff box, and plenty of water was available, the crew was able to get the fire under control within this short time.

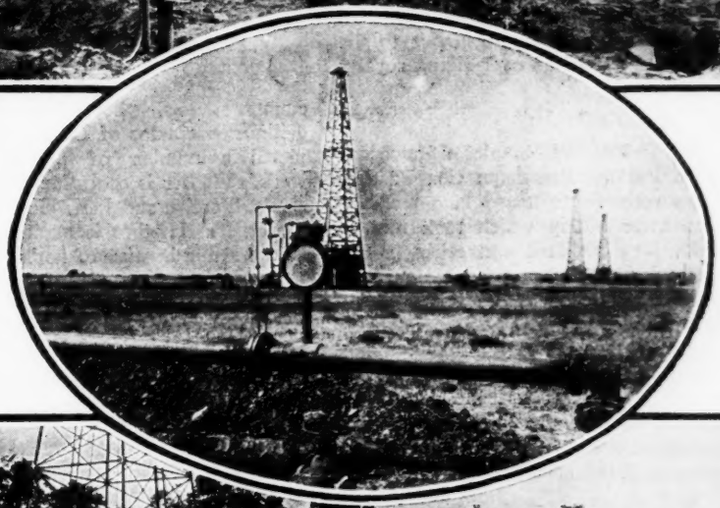
District Jobbers Organize

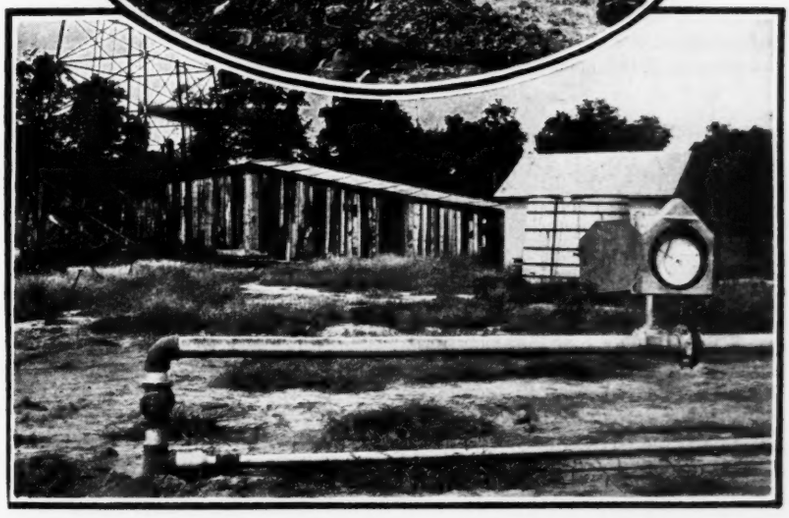
CANTON, O., Dec. 4.—The Stark County Petroleum Marketers Association was organized at a dinner on Nov. 11, composed of Massillon and Canton, O. jobbers. Meetings will be held monthly, according to William M. Thompson, vice president of Allegheny Oil Co., Canton.

Officers were elected and include: George W. Lloyd, president; J. P. McIntosh, vice president; R. L. Ripley, secretary; H. L. Gilbert, treasurer; R. G. Knight, director.

The Real Test of a Meter







After all, there's only one real test of the worth and reliability of a meter.

Is It Accurate?

TO BE ACCURATE, principle and design must be correct—material and workmanship must be of first quality. The design of Metric Orifice Meters is such that the possibility of total variations from any twisting or bending action, friction, or play in joints shall never exceed ¼ of 1% in the calculated results. This extreme precision is secured through uniform area of the mercury pots, large area of float, long lever arm, small angle of movement of the pen, minimum number of moving parts and few surfaces affected by friction.

For 38 years we have manufactured meters for use on the lease, in the refinery, pumping station and everywhere there is service in the measurement of oil, gas, gasolene, steam and water. Every effort has been made to make the most accurate and economical meters possible. That our efforts have been rewarded is evidenced by the reputation gained by Metric Meters for accuracy—which is the final test.

WESTCOTT & GREIS, INC.
Sales Service

DALLAS TULSA LOS ANGELES

METRIC METAL WORKS

of the American Meter Company-Inc.

ERIE - PENNSYLVANIA - U-S-A

Our Industry—A Page of Facts and Observations

National Petroleum News

ONE of the most interesting deep wildcat test holes in Texas, the No. 1 Chittam of the Rycade Oil Corp., in Maverick county, has been drilled into a gas horizon at total depth of 5550 feet. Along with the gas came a spray of gasoline sufficient to mightily encourage the owners of the well, regardless of whether the test makes a commercial producer or not. The well which is located near the Rio Grande, between the border towns of Del Rio and Laredo, has been drilling for more than a year. It is located on a great surface structure, more than 40 miles long, which has an upthrow of fully 1500 feet. The showing found is believed to be somewhere near the base of the Trinity beds of Lower Cretaceous geological time. Anyhow, the drill penetrated well down into the Trinity, as the overlying Glen Rose formation is known to have been topped at about 4300 feet. The well is on acreage originally leased by J. D. Collett, president of the Texas division of the Mid-Continent Oil & Gas Association, who turned it to the Rycade and retained an over-riding royalty interest.

* * *

HARRY TROWER, sales manager of the Phillips Petroleum Co., Bartlesville, has returned to his Oklahoma headquarters after a trip which took him to Houston, New Orleans and other points. Trower, who handles raw natural gasoline sales, says his company has brought its manufacturing operations up to the point where it turns out a half million gallons of material daily. The Phillips company, which a few years ago was no more than a small though substantial outfit, has recently had its crude oil production up to a level in excess of 80,000 barrels daily.

* * *

SPENCER B. TERRY of the Pratt & Whitney Co., Hartford, Conn., has been appointed to the following standardization committees of the American Petroleum Institute, succeeding Paul M. Muller, who resigned from Pratt & Whitney to engage in another line of work:

Special A. P. I. committee on standardization of gages and gaging practice; sub-committee on gages and gaging practice of the special A. P. I. committee on the standardization of cable drilling tool joints; and the sub-committee on gages and gaging practice of the special A. P. I. committee on the standardization of rotary drilling equipment.

* * *

HARRY A. BAKER of Okmulgee, Okla., has taken over the 3400-acre block of leases in south central Jack county, Texas, that previously belonged to Charles F. Balph. The transfer calls for the drilling of a test well operations to begin before Jan. 15, next. Fresh attention is also being given to Jack county by other operators, among them the Roxana Petroleum Corp., which has been working a number of geologists in a general northeasterly direction from the town of Jacksboro. The Roxana several years ago completed the only producing well in Jack county, the test being completed in the Ranger lime series beds at about 4000 feet. It made about 25 barrels daily and stands as the farthest northeast outpost of lime production in the general Ranger territory.

* * *

E. C. MONCRIEF, chief geologist of the Derby Oil Co., Wichita, Kan., has been in the San Angelo territory recently looking over developments affecting the West Texas salt basin area. His company may decide to expand its Texas operations outside the Panhandle district, where it is already active.

* * *

ONLY two rigs are now running in the so-called Hooser pool of Cooke county, Texas, where John W. Hooser, drilling contractor of Dallas, recently completed a number of profitable shallow wells. Hooser is operating one of the two rigs still active and J. K. Hughes of Mexia the other. Hughes is making a test that is interesting because of its being the farthest northwest location in the pool. Six producing wells have been completed, three by Mr. Hooser, whose production has recently averaged as high as 700 barrels daily. Others owning Hooser pool production are C. C. Lanier, Lynch & Stahl and the Sun Oil Co., each with one well. Production is found at approximately the 1200-foot level.

* * *

THE West Texas Geological Society, formed at San Angelo by geological representatives of various oil companies operating in the general area, plan to cooperate with the Texas Bureau of Economic Geology on subjects of general interest. Unanimous indorsement of the plan was given at a banquet in San Angelo, at which Dr. E. H. Sellards of the Bureau was a guest. A committee to work out plans consists of Edgar Kraus, Atlantic Oil Production Co., chairman; Dr. H. P. Bybee, Dixie Oil Co.; Robert Imbt, Pure Oil Co.; J. Ben Carsey, Humble Oil & Refining Co.; D. D. Christner, Marland Oil Co. of Texas; Tom Buzzo, Phillips Petroleum Co.; Major Lewis, Republic Production Co.; Floyd C. Dodson, El Capiten Oil Co.; V. E. Cottingham, The Exploration Co.; R. T. Lyons, Skelly Oil Co.; C. P. Butcher, Kirby Petroleum Co. and Messrs. Ackers and Moore of the Southern Crude Oil Purchasing Co., and the Roxana Petroleum Corp, respectively.

C. W. HARRISON, who has been active for several years in the Kosse section of Limestone county, Texas, has turned over to the Pandem Oil Co., of Wichita Falls, his interest in a joint test on the Bassett farm, in the J. Walker survey. The Pandem, which is going ahead with the test, was drilling in shale at 2400 feet. Harrison is now getting up a block of leases in eastern Falls county, in the A. Whittaker, William P. Cartwright and G. Dugan surveys. A number of tests have been made in the Kosse territory since the A. E. Humphreys interests completed a well on the Jones land, in 1922, for 48,000 barrels total yield. The well never could be put back on production after it stopped flowing. The Humphreys-Jones well encouraged the drilling of many other tests near Kosse but invariably these proved non-productive at or above the 3700-foot level where the oil flow was found.

* * *

IT is reported without confirmation that the Roxana Petroleum Corp. has leased the whole of the Matador ranch in the Texas Panhandle and will drill a test well after completing its geological investigation work. The ranch, which is located mainly in Motley county, consists of roundly 450,000 acres. The Roxana recently has had several corps of geologists working through Motley, King, Knox and Stonewall counties.

* * *

F. N. SNYDER of Putnam, Texas, is looking after operations in West Texas of the Whittmer Property Trustees of Pittsburgh, who have made location for a test on the Susan N. Roberts ranch, near Arden, in Irion county. The test will be drilled with a Star rig as the prospect is for shallow production. J. P. Williams of Spring Creek, Texas, has the drilling contract.

* * *

INTERESTING, wasn't it, that recent reports of the United States Bureau of Mines showing approximately 661,679 wells were drilled for oil and gas in the United States from 1859 to 1924, inclusive; and 129,875 of them, or roughly 20 per cent, were dry holes. It might not be amiss to mention that a large part of the dry hole percentage ties-in on operations in the last ten years of the period covered, when deeper drilling made wildcatting costs measurably greater than previously. Just another tribute to an industry constantly looking ahead to the rewards that come from pushing field fronts outward.

* * *

ROBERT G. CARR and Preston Northrup, both formerly of Houston, are now established at San Angelo, with offices at 315 Rust building, handling the West Texas properties of the Texas & Pacific Land Trust, totalling some 2,500,000 acres. Carr formerly was head of the land department of the Humble Oil & Refining Co.; Northrup was for a time connected with Mike and Will Hogg, oil operators and royalty owners, at Houston, after being graduated a few years ago from the Texas A. & M. College.

Completion of Panhandle Pipe Lines Promised by June 1, 1927

By Paul Wagner
N. P. N. Staff Writer

HOUSTON, Dec. 4

IN the background of four pipeline projects which eventually will give outlet for 115,000 barrels of Texas Panhandle crude daily, looms the problems necessarily incident to future operation of these transportation units. Virtually all four projects, however. will begin to operate in summer months, a fact which will permit experiments on which to base transportation methods that probably will be necessitated with the coming of cold weather in 1927.

As announced on page 48-A, Nov. 24 issue of this periodical, the Prairie Pipe Line Co. expects to complete by May 1, the line now under construction from Kingsmill, Texas, to Ringling, Okla., approximately 224 miles. This is an 8-inch carrier project to be buried 40 inches below the surface to preserve even temperatures as nearly as possible.

Humble Pipe Line Co., which on Nov. 23 officially announced completion of plans for a 10-inch pipeline from its Burnett tank farm, Carson county, to a juncture with its trunk system at Comyn, Texas, expects to have this line in operation by June 1, next. As previously announced, this line will give outlet for 30,000 barrels of crude daily from the Texas Panhandle; the Humble's pipe line plans also contemplating looping of its system south to Baytown and Texas City, on the Gulf to give total trunk line capacity of 120,000 barrels daily.

Gulf and Magnolia Lines

FACILITIES planned by the Gulf Pipe Line Co. and the Magnolia Petroleum Co., to be in operation next spring, will provide an outlet for 30,000 barrels daily at first. As announced on page 22, Nov. 24 issue of this periodical, the Magnolia will build north from Olden, in the Ranger territory. and the Gulf will build south from the Dial and Whittenburg producing properties in Hutchinson county, the two 10-inch lines joining about midway between the two districts mentioned. Although each company will own its own line, arrangements are to be worked out whereby the carriers will join and permit earlier movement of crude through the connected systems.

Because of the arrangement between the Gulf and the Magnolia, which will permit runs earlier than would have been possible were each to build the entire distance separately, the Panhandle territory should be provided with about 85,000 barrels' outlet capacity by June 1. Eventually, if conditions warrant each of the Magnolia and the Gulf probably will build a line the entire distance of 235 miles, bringing total outlet facilities to roundly 115,000 barrels daily.

Summer Studies Permitted

EACH of the four companies now having pipe line projects under way will be able to study the transportation under summer conditions. Special installations probably will be necessary to handle the oil in winter.

Two or three methods are available for handling heavy paraffin content crudes, which congeal at temperatures from 52° F. to 60° F., such as produced in the Texas Panhandle. These include use of heaters, arranged so melting snows would not materially affect operation of the pipe line. Another method would be to build stations close together to avoid the dissipation in too short a distance of heat applied to the oil. A third method, which has been experimented with in some quarters, involves the cracking of certain parts of the crude before attempting to transport it. Any of the systems involves greater construction and operating expense than normally experienced.

Cracking Method Proposed

THE cracking system would involve the taking out of the crude of a percentage of paraffin and the breaking it up before mixing the oil together again for pipe line transportation. Experiments have shown, it is said in authoritative quarters, that the gasoline content of the crude is increased sufficiently by such a procedure as to pay for the cost of the operation, but the cost of the cracking plant is another question.

Pipe line authorities have said it would be necessary, to do something to preserve fluidity of the crude in cold weather if the capacity of the carrier system was not to be materially reduced, or the lines blocked.

Costs will be higher than normal, pipe line authorities said, because of the necessity for building cracking plants, the installation of extra pumping stations, or intermediate heating plants, on the other.

Territory's Future Assured

PIPE line companies now building into the Panhandle, it is said, are doing so with a full realization that the future of development is such the territory can be ignored no longer from a transportation viewpoint; but construction, the officials of some of them have said, does not reflect competition in a dollars and cents basis with railroads, which up to now have been the sole means of outlet.

The pipe line construction, these officials have said, is not to provide a cheaper outlet, it contemplates the provision of the only adequate outlet they regard possible for the future. In this connection the completion of pipe line outlets will not, in their opinion, bring Panhandle crude to a price parity with certain other high gravity crudes. Panhandle oil will have to establish its own place in competition with other crudes, refinery values, and transportation costs considered in their proper proportions.

California Production Up 6000 Barrels

Staff Special

LOS ANGELES, Nov. 27.—Daily crude production in California increased about 6000 barrels during the week just closed, the increase coming from Huntington Beach, Long Beach and Seal Beach, Ventura Avenue declined 3000 barrels, with only one small completion, too small to even up natural decline of old wells.

Huntington Beach new town lot area production now equals the production in the old field, with 100 wells drilling in the new area. It is thought further increase will be shown by this field next week, followed by the start of the decline the following week, as new wells decline in flush production.

Marland Oil Co. had to kill one of its four producers at Seal Beach to work over, thus giving this field daily production of 8000 barrels for the week from three wells. Two and probably three new wells are due in the next week, practically guaranteeing a further increase in production.

The completion of several new wells the past two weeks in the old Long Beach field brought about an increase, as one of the new wells made 2800 barrels the first day, indicating that there was plenty of oil still left in the old area. The extension is showing a fast decline and a number of producers have been killed and derrick moved away.

There are very few new wells starting in the state outside of the active Los Angeles Basin fields, with the producers paying more attention to making the old wells produce more oil than to drilling new wells.

Ethyl Gas Marketing Situation Causes Anxiety to Some Refiners

By Paul Truesdell
N. P. N. Staff Writer

CLEVELAND, Dec. 6

THE increasing demand for and the widening distribution of Ethyl gasoline is bringing many refiners face to face with an acute problem. Some of them see their competitors awarded licenses to mix and sell Ethyl gasoline and fear that they will suffer large losses of business unless they are speedily granted licenses and enabled to sell Ethyl gasoline also to their customers.

There are doubtless many refiners who do not and will not want to sell Ethyl gasoline. Many may develop an anti-knock fuel that pleases their customers as well as Ethyl gasoline. That is their own affair of course, but it appears that unless the Ethyl Gasoline Corp. during the next few months exercises the utmost good judgment and sense of fair play, many refiners may be injured unduly through inability to get the anti-knock material, although they are anxious to take on its sale and comply with all the rules laid down.

Two fixed limitations govern the speed with which the Ethyl Gasoline Corp. can take on new refiner licenses and start them in business as Ethyl gasoline dispensers, according to statements of officers of the corporation. The first is that the necessity for corporation engineers to carefully supervise the design, construction and operation of mixing plants, which are to be located only at refineries, makes it impossible to move very fast in putting in mixing plants.

The second is that the manufacturing equipment for the production of Ethyl fluid is fixed and cannot be enlarged much, from the standpoint of good business, until a larger permanent market for the product is assured. Therefore, the widening of the marketing facilities for Ethyl gasoline must move gradually.

Skeleton Not Filled Out

WHILE the distribution of Ethyl gasoline now covers the entire country in a sketchy way, there are many districts where its distribution is exceedingly thin. The structure of the marketing scope of the anti-knock fuel is something like a skeleton. The bones are complete but they are not filled out with flesh.

That being the case, the refiners think that the Ethyl Gasoline Corp. should weigh every application from a refiner for a license very carefully and should, so to speak, award the limited number of licenses that are available in the near future where they will do the most good. We believe the corporation should take care of the refiners who are marketing their products in hot competition with refiners who are able to offer their customers Ethyl gasoline, before they open up any new territory. This is not intended as a criticism of anything the Ethyl Gasoline Corp. has done or is doing.

The Standard of Indiana territory is out of the question from the Independent refiners' standpoint until 1929 as was stated recently by E. W. Webb, president of the Ethyl Gasoline Corp. and published in National Petroleum News. But how about competitive conditions in other territories?

Ethyl gasoline will find a better demand in some territories than in others, of course. Probably in some it will move comparatively slowly, such as in flat country or in territories where benzol blends are strongly marketed or where the ordinary gasoline dispensed is of a rather high order of anti-knock value. In some territories the license to sell Ethyl gasoline may not give a refiner a serious advantage over his competitors. In other territories where one refiner has the license and the others cannot get it it is conceivable that the Ethyl gasoline-dispensing refiner might almost put his competitors out of business.

Add to this situation the fact that licenses to jobbers to buy Ethyl gasoline from refiners and sell it at retail are being issued very rapidly, and the seriousness of the situation becomes greater. Giving a jobber a license to sell Ethyl gasoline practically ties him up of necessity to buy from the refiners who can furnish it because one of the stipulations of the license contract under which the Ethyl Gasoline Corp. takes on licensees, is that the latter shall diligently push the sale of Ethyl gas.

Must Buy From Licensed Refiner

IF there is only one refiner in the territory from which the jobber's supply must come, he must buy from that refiner regardless. The situation in Pennsylvania is a good example for illustration. There are scores of jobbers in Pennsylvania licensed to sell Ethyl gasoline. There are only four refiners and sell it at wholesale. These are the Atlantic Refining Co., The Waverly Oil Works Co. the Pennzoil Co. and the Sterling Oil Co.

If a jobber in Pennsylvania or some nearby state, who has been buying his gasoline from one of 100 or so other Pennsylvania refiners gets a license to sell Ethyl gasoline, he has got to quit his refinery source of supply and buy from one of the four who has a mixing and wholesale selling license. Not that there is any objection to any one of these four companies getting all the business they can or to the jobber buying from any refiner he sees fit but it is plain to see that great hardships will be imposed on refiners if circumstances beyond their control operate to actually force customers to take their business elsewhere.

We don't know whether any Pennsylvania refiners other than those licensed have applied for licenses to sell Ethyl gasoline but if they have, we believe the Ethyl Gasoline Corp. should stretch a point and give them licenses in preference to licensing to refiners less hard pressed by competition.

Oklahoma is one of the latest states where a mixing plant has been installed. This is under the license of the Continental Oil Co., with headquarters in Denver. The Oklahoma mixing plant is at the Continental's refinery at Sapulpa, formerly the Sapulpa Refining Co. There are more than 30 mixing plants in the country, exclusive of the many operated by the Standard Oil Co. of Indiana. These mixing plants are located by states as follows:

California
Union Oil Co., Wilmington.

Colorado
Continental Oil Co., Florence.

Georgia
Standard of Kentucky, Savannah.

Florida
Standard of Kentucky, Port Tampa, Jacksonville.

Kentucky
Standard of Kentucky, Louisville.

Louisiana
Standard of Louisiana, Baton Rouge.
Mexican Petroleum Co., Destrehan.

Maryland
Standard of New Jersey, Baltimore.
American Oil Co., Baltimore.

Massachusetts
Beacon Oil Co., Everett.

Montana
Lewistown Oil & Refining Co., Lewistown.

New Jersey
Standard of New Jersey, Bayway, Bayonne.

New Mexico
Continental Oil Co., Artesia.

Ohio
Refiners Oil Co., Dayton.

Oklahoma
Continental Oil Co., Sapulpa.

Pennsylvania

Atlantic Refining Co., Philadelphia.
Pennzoil Co., Oil City.
Sterling Oil Co., Emlenton.
Waverly Oil Works, Pittsburgh.

South Carolina

Standard of New Jersey, Charleston.

Texas

Humble Oil & Refining Co., Baytown, Burkburnett.

Utah

Continental Oil Co., Salt Lake City.

Virginia

Standard of New Jersey, Sewell's Point.

Washington

Spokane Oil & Refining Co., Spokane.

West Virginia

Standard of New Jersey, Parkersburg.
Sterling Oil Co., St. Mary's.

Wyoming

Continental Oil Co., Glen Rock.

That the jobbers also are much interested in Ethyl gasoline was shown by the manner in which they questioned Mr. Webb after he delivered his paper at the convention of the National Petroleum Marketers Association at Atlantic City Oct. 27. One point that did not seem to be made quite clear at that meeting was whether a refiner mixing and selling Ethyl gasoline to jobbers could compel the jobbers to sell the Ethyl gasoline under the refiner's brand name.

Mr. Webb says that there is nothing in the contract that the Ethyl Gasoline Corp. makes with the licensee to prevent his forcing the jobber to sell it under his brand name—if he can. It is expected by the Ethyl Gasoline Corp., however, that as more and more refiners take on the sale of Ethyl gasoline, it will be impossible for a refiner long to hold that position. If the refiner insists then on the jobber selling it under his name, the jobber can simply buy from some other refiner. Now his choice is restricted.

The Ethyl Gasoline Corp., however, has worked out a plan for the jobber who does not care to sell Ethyl gasoline under a name or brand of his own. For such a jobber, the corporation furnishes him with signs, pumps globes and so on bearing the Ethyl gasoline trademark at cost, these being shipped direct to the jobber by the manufacturer. By this system it is possible for the jobber to get his signs and start business considerably more quickly than he can if he lays out his own signs and orders them from the manufacturer, Mr. Webb points out.

HOUSTON, Dec. 4.—Transcontinental Oil Co., principal operator in the Nigger Creek field, west of Mexia, in Limestone county, is now operating its two-unit portable natural gasoline plant recently installed at a cost of about $50,000. The plant is recovering an average of about 4000 gallons of natural gasoline daily. It is located on block 28 of the A. E. Rosson tract.

MATHIESON Chemicals

Mathieson Traffic Service

THE complicated industrial structure of today has made transportation one of the foremost problems with which industry has to contend. Expert traffic counsel has become essential to the prompt and efficient handling of freight movements.

In the chemical-consuming industries in particular, where highly technical materials are dealt with, the traffic expert is indispensable. Yet comparatively few consumers would be justified in maintaining a traffic department of their own in order to keep fully informed on traffic matters.

It is for this reason that the Mathieson organization includes a full staff of traffic experts for the service of all customers. Questions of freight rates, routings, tracing and expediting of shipments, claims against carriers, etc., are all handled for Mathieson customers by our well organized Traffic Department. Our staff welcomes the opportunity of assisting customers with their traffic problems and is on the alert at all times for traffic changes which might affect their interests, whether or not such changes have any direct connection with Mathieson products.

Consumers should give careful consideration to the advantages of Mathieson traffic service before seeking a source of supply elsewhere.

The MATHIESON ALKALI WORKS Inc.
250 PARK AVE. NEW YORK CITY
PHILADELPHIA CHICAGO PROVIDENCE CHARLOTTE

Caustic Soda Liquid Chlorine
Bicarbonate of Soda
Anhydrous Ammonia

Soda Ash - Bleaching Powder
Modified Virginia Soda
Aqua Ammonia

Deal Direct with the Manufacturer

Visiting Around the Refineries

By Paul Truesdell

National Petroleum News

Petroleum Coke As A Source of Vanadium

DR. ALFRED OBERLE, consulting chemist with the Cross organization in Kansas City in talking with the writer in Pittsburgh recently, said that petroleum coke offers a more or less important source of vanadium, so much in demand for making alloy steels used in the automobile industry. Recovery of the vanadium does not interfere with the use of the coke as fuel. In fact, the vanadium is leached from the coke ash with water.

Dr. Oberle said he had recovered a considerable amount of vanadium from the coke that he burned in the furnace of his home in a Chicago suburb.

To prevent burning out of the grate bars, Dr. Oberle kept a thick layer of ashes between the grate bars and the fire. He put a small perforated water coil in the ashpit, close up to the grate bars. By means of a small pump, he continually sprayed water into the ashes. Some of the water went up through the fire, was converted into steam and then into water gas, helping to keep down slagging and clinkering. Most of the water, however, did not reach the boiling temperature but merely leached through the bed of ashes and dripped down into a pan set in the bottom of the ashpit.

When this pan became full, Dr. Oberle would pump the water into another open pan placed on top of the furnace. There the water would quickly evaporate, leaving a deposit of vanadium oxide crystals. He has a patent, U. S. No. 1,570,170, applied for June 25, 1924 and issued Jan. 19, 1926 covering "Process for Recovering Vanadium from Petroleum Hydrocarbons."

He says the percentage of vanadium recoverable varies greatly in cokes from different crudes, however, he says, it makes no difference whether the coke is produced by straight distillation or cracking.

Inventor of Knox Cracking Process Is Dead

NEWSPAPERS carry news of the death of William John Knox at his home in New York. Considerable was heard two or three years ago about the Knox cracking process that was being developed. A plant was built at Texas City and stock in the company controlling the patents was offered to the public.

So far as we know, the process has never been operated on a commercial scale and little is heard of it in the oil industry nowadays. Mr. Knox was a distinguished chemist and for 14 years was chief chemist for the late George Westinghouse.

Develops Paint That Will Stick to Wet Pipe

FORREST A. HOFF of Warren, Pa., stopped in to visit us the other day on his way to Louisville, Ky., where he was going to advise the States Oil Co. on how to make lubricating greases.

Mr. Hoff has a grease plant in Warren where, in addition to a regular line of lubricating greases, he manufactures a special asphaltic paint. Originally designed as a roof paint, Mr. Hoff says he has found a use for it in refineries. It has the property, he says, of sticking to a wet surface, in fact, it can be painted on under water.

A refinery in Warren is using the paint on the ammonia pipes in the refrigerating plant and it sticks. Of course, the ammonia pipes are always sweating. Besides the ingredients that give the paint its waterproof character, asbestos is put into it which gives it considerable insulating value. Mr. Hoff says that a thick layer of the paint is smeared on the pipe, a wrapping of tar paper or some similar material is put on, and then another thick layer of paint. This insulates and preserves the pipe at the same time.

Treat Continuously With Sulfur Dioxide

DR. L. EDELEANU, inventor of the sulfur dioxide process of refining kerosene and other products, told the writer while he was visiting the International Conference on Bituminous Coal in Pittsburgh recently that an installation of his sulfur dioxide treating equipment has recently been put in at an American refinery to operate continuously.

Several plants, among them the Associated Oil Co. of California, have been using the sulfur dioxide treating process for some time but have been running batch. The use of the process continuously involved a number of problems but these evidently have all been solved.

Dr. Edeleanu said also that developments of importance may come in the use of the "extract" or unsaturated parts of the kerosene which is taken out by the SO_2 treatment, as an anti-knock material. The stuff has high anti-knock value and the doctor said that considerable work has been done in Europe toward making an anti-knock fuel by blending gasoline with the extract.

Institute Study of Sulfur in Petroleum

NEW YORK papers announce that the American Petroleum Institute, on recommendation of the National Research Council has granted Johns Hopkins University, Baltimore, $4000 for immediate use in research to establish scientific methods for the identification of sulfur compounds in petroleum.

This is a part of the research program made possible by the donations of John D. Rockefeller and the Universal Oil Products Co.

Dr. E. Emmet Reid, secretary of the faculty chemistry committee of Johns Hopkins, a distinguished organic chemist, will have charge of the work which will be carried on by Dr. Parry Borgstrom, a 1919 graduate of the University of California. The identification of the sulfur compounds in petroleum, particularly in cracked distillates, and the removal of those that are harmful is considered by refiners and chemists to be one of the most important problems in connection with refining.

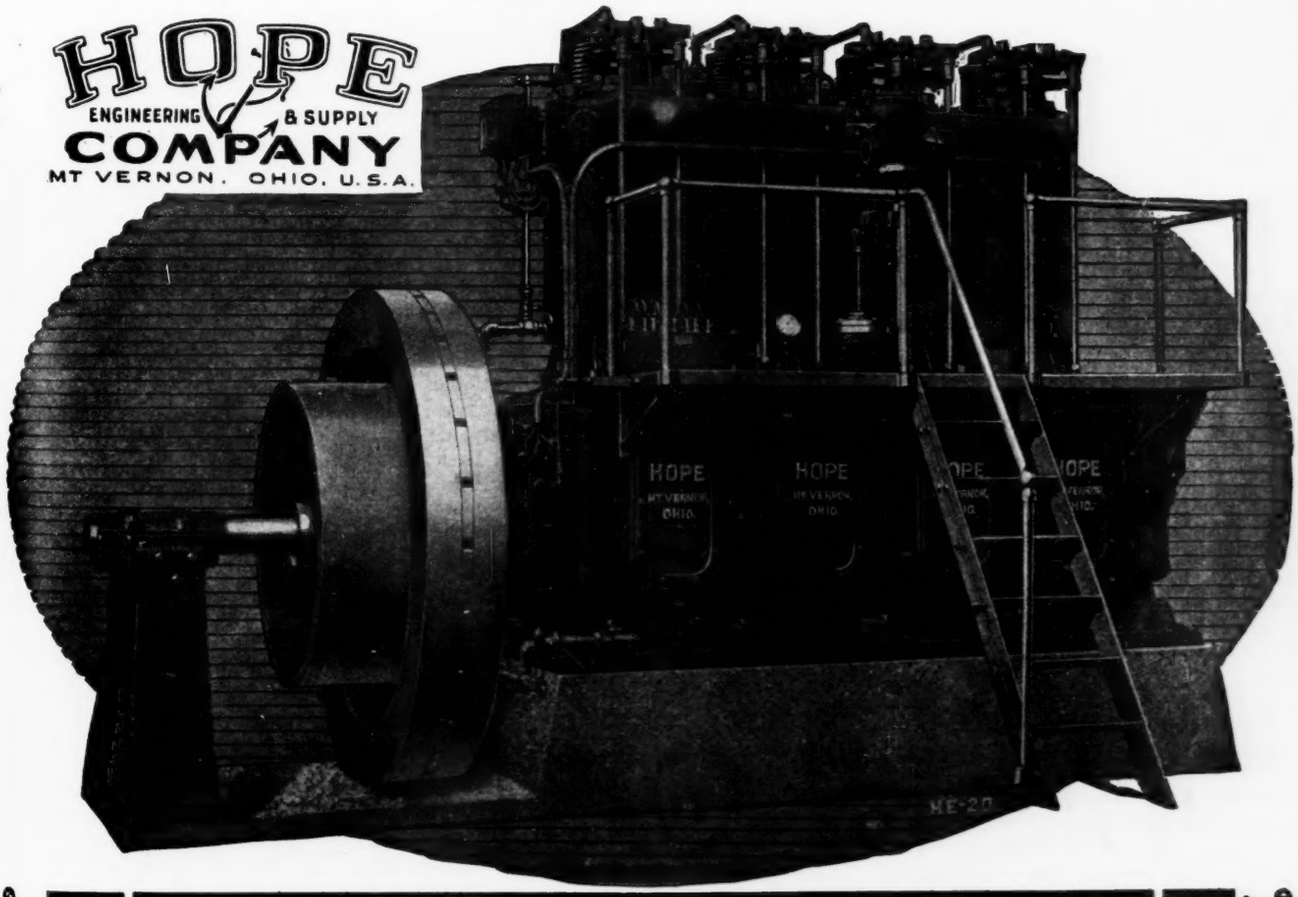
It is possible that the study to be carried on will throw some light on the moot question of how high a sulfur content in gasoline is allowable from the standpoint of safety from corrosion.

HOPE
VERTICAL
GAS ENGINES
3 and 4 CYLINDERS — 60 to 250 H.P.

NO Hope product was ever cheapened in design, materials or construction in order to meet low-priced competition. Hope Standards are not measured in dollars and cents. And in Hope Vertical Gas Engines, the standards and ideals of the Hope Company find concrete expression.

These high-duty units are built to be—and have proved themselves to be—dependable and economical prime movers. Within the fields where natural gas is available, you cannot secure cheaper, more reliable power than the Hope Gas Engine will give you.

A request from you will bring you prices and specifications on the power you need.



ENGINEERS & CONTRACTORS IN NATURAL GAS AND OIL

More Gasoline to Move in 1927 on Basis Of Market, Date of Shipment

By J. C. Chatfield
N. P. N. Staff Writer

TULSA, Dec. 4 NO fundamental change in the contract relationship between Mid-Continent refiners and jobbers in the middle west appears likely for 1927. New gasoline contracts now being written to cover next year's business, apparently will follow much the same lines as those in effect in 1926.

If any change can be noted, it is that the flat marginal contract will be even less employed than now. The market date of shipment, or M. D. S. as refiners are shortening it for sake of convenience, apparently will be the type of agreement under which a large part of contract gasoline will move to the trade next year.

Competition is keen as usual for contracts which will give an assured outlet for some portion of the refinery output. Chief result of this competition apparently has been to bring out a modification of the M. D. S. agreements which will guarantee the jobber a living margin at all times.

Some refiners in the Mid-Continent field have already obligated all of the gasoline they expect to contract. Others have been watching developments in contract making and proceeding cautiously, making only a few contracts here and there with old customers.

Take Your Choice

THE substantial jobber seeking contract agreements with a refinery source of supply can find almost any variation of the M.D.S. he may fancy. In some cases he can have a straight marginal contract, if he insists, or at least some sort of a cross between the marginal and M.D.S. contract.

Some refiners will ship on a market basis with no limit in any direction. Some will guarantee the jobber a small minimum margin under the general tank wagon level and demand any surplus over a maximum margin. Others have a minimum guarantee and no maximum. In some cases the jobber may take out half of his goods on a guaranteed margin and the remaining half on a market basis.

Two years ago the Mid-Continent Petroleum Corp. began to base its marginal guarantees on the service station rather than the tank wagon price. This company has followed the same policy again for 1927, but it is the only one using this basis.

Other refiners appear to feel the tank wagon is just as reliable as the price to the public and that there is no danger of the major price leaders setting up a three cent or wider margin for their service station connections. One refiner said this week he had more fear that some of the large companies might make the tank wagon price the same as the service station price. This has been done by the Magnolia Petroleum Co. at some points in Texas and the Roxana Petroleum Corp. in Ohio although dealers are allowed a discount on their purchases under the identical tank wagon and service station price.

It is understood that the Mid-Continent has placed contracts covering virtually all the gasoline it will have to offer the trade for next year aside from the material which it will reserve for spot market requirements, being one of the first to achieve that result. Virtually all these contracts are on a spot market basis with a minimum guarantee under the tank wagon.

One large refining company is offering its customers a contract which provides a minimum of 4 cents a gallon under the tank wagon and a maximum margin of 5 cents a gallon. Between those two figures the price slides with the spot market. This company sold 5 per cent of its gasoline output last year on flat marginal contracts, 10 per cent on M.D.S. agreements with no maximum or minimum and 15 per cent on a contract identical with the one it is offering for 1927.

Will Make No Contracts

ANOTHER company which sold around 48 per cent of its gasoline in advance last year and kept 52 per cent for the spot market has determined to offer no contracts for 1927, but will market the entire output from day to day. This is a policy which has not been followed except by some of the small operators in the past who were not sure that they would operate continuously throughout the year.

One of the major Independents in the Mid-Continent with several refineries offers its customers their first car of gasoline at 4 cents margin under the general tank wagon level and the next car at the spot market with no guarantee. This policy was followed by the company this year with the exception of one small flat marginal contract.

This company will urge its customers to take this 50-50 contract for 1927. In case the jobber refuses he will be given an opportunity to buy his entire requirements on a spot market basis and will be given a minimum marginal guarantee of 3 cents a gallon. If this option does not please the jobber as a last resort the refiner will offer a flat 4-cent marginal contract providing the freight rate is not too high and the area has a good history for stabilized tank wagon markets.

One company, with an output of 600 cars of gasoline a month, sold an average of 85 cars a month on M.D.S. contracts last year. It sold only 5 cars a month on a flat marginal contract basis. For 1927 the company expects to have no marginal contracts and to sell about 90 cars a month on an M.D.S. basis.

This company, in common with other refiners, insists that the jobber buy his kerosene on the same contract on a market basis. Those refiners who manufacture lubricating oils almost without exception require that the jobber buy his oil in order to get the gasoline.

Sold on M. D. S. Contracts

REFINERS apparently are sold on the idea that the best way to assure that their goods will be shipped and that the customer will be satisfied is to sell on a market basis. Those refiners who have had a few marginal contracts this past year have had difficulty from time to time in making jobbers take out the goods. This is particularly true lately, when some

Clause Suggested Based on New Gasoline

CHICAGO, Dec. 4.—The National Petroleum Marketers Assoc. has suggested to its members, in a special bulletin, the insertion of a clause in their marginal contracts with refiners for gasoline protecting them against a gasoline of new standards being sold by the major marketing companies to take the place of the competitive U. S. Motor grade.

In a special bulletin the association suggests the jobber have his next marginal contract carry a clause reading about as follows:

"Gasoline furnished under this contract must conform in general specifications and quality to the product being sold by Standard Oil Company for the price on which this marginal contract is based, or be the competitive equivalent of the gasoline so sold."

If the jobber and his refinery source elect to meet a 60-62, 400-end point gasoline sold by the Standard, with a 54-56 gasoline of high anti-knock rating, this clause would make an adjustment on that basis possible, the bulletin points out.

marginal contracts have been bringing approximately 12 cents a gallon, while the spot market has been nearly 2 cents a gallon lower.

When the M. D. S. contracts were first devised it was in the belief that friction between buyer and seller would be eliminated to a large extent. Under the old marginal contracts some party to the agreement was almost always taking a loss as compared with the open market established as the result of free trading. The M. D. S. agreements simply function to give the jobber an assured source of supply of a uniform grade of goods at a fair price. To the refiner it gives an assured outlet at a fair price, if the price established as a result of open competition can be considered fair.

Recent surveys by the sales departments of some Mid-Continent refiners indicate that they will not be able to place any large quantity of their gasoline in Ohio and adjacent territory under contract for 1927. It is reported that Mississippi river refiners with a relatively low freight rate to Ohio, are competing actively with Atlantic coast and western Pennsylvania and Kentucky refiners for the Ohio business on a basis that the Mid-Continent cannot hope to meet. Some reports have been that Ohio jobbers are able to buy gasoline on contract for 1927 at a guarantee margin of 4½ cents a gallon under the tank wagon. There is no prospect that the railroad rate attack made by Mid-Continent refiners recently will affect Ohio territory next year. If a favorable decision is reached new rates probably will not go into effect before the last of 1928.

Carbide—Texas Co. Trial Set

TULSA, Dec. 4.—Trial of the Carbide & Carbon Chemicals Corp.'s suit against The Texas Co. will begin in the U. S. District court at Houston Jan. 17, according to information received here this week. The Carbide & Carbon company alleges violation of the Thompson patents on stabilized gasoline recovered from natural gas and on the process used by The Texas Co. in manufacturing the product.

The Carbide corporation also has sued the Phillips Petroleum Co. for alleged violation of the same patents. Date of hearing of the Phillips case has not been set.

New Marketer Builds Stations

ILION, N. Y.—A new oil marketing company has been organized here, which will operate under the name of the Triumph Oil & Refining Corp.

Officers are: William Brennan, Mohawk, N. Y., president; Walter Fey, Utica, vice president; Walter S. Becker, Little Falls, N. Y., treasurer; and C. L. Seavey, Utica, secretary and general manager.

A bulk station and service station are being built, the former at Utica and the service station at Ilion. Headquarters are at Ilion.

Type K 16x30x10 ft

There are 70 Different Types of Permanent

Shepard Stations

QUICK DELIVERY
READY FOR QUICK ERECTION
BY YOUR OWN MEN

WIRE COLLECT FOR CATALOGUE

Arthur B. Shepard Corporation
Architects and Manufacturers
11 Broadway New York

GULF Refining Company

General Sales Offices
PITTSBURGH, PA.
District Sales Offices
New York, Houston, Atlanta, Boston, New Orleans, Tampa, Philadelphia

REFINERS OF OKLAHOMA
TEXAS AND LOUISIANA

PETROLEUM

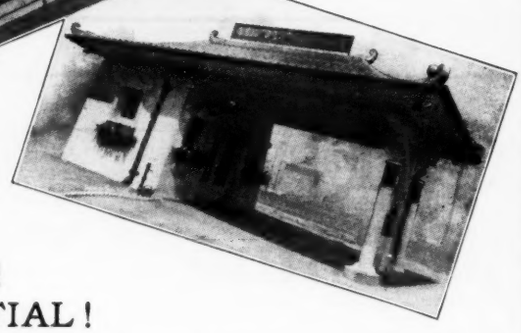
REFINED OIL
GASOLINE
NAPHTHA
GAS OILS
PARAFFINE WAX
ASPHALT

Fuel Oil--Lubricating Oils

CYLINDER ENGINE
CORDAGE

RED AND PALE PARAFFINE OILS

STEEL BUILDINGS for EVERY PURPOSE



WAREHOUSES
OIL STATIONS
GARAGES
PUMP HOUSES
SUB-STATIONS
METER HOUSES
BUNK HOUSES
TOOL SHEDS

FIRE-PROOF!
ECONOMICAL!
and SUBSTANTIAL!

Send for our complete catalog of "STEEL BUILDINGS"

THE EDWARDS MANUFACTURING CO.
524-544 Eggleston Ave. Cincinnati, Ohio

"THE BOYS" KNOW!

"Our grease maker prefers the new kettle and would rather handle the grease in this kettle than in the old ones."

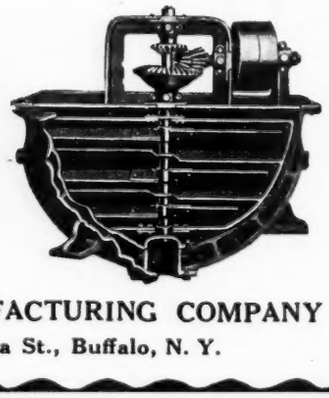
"We were able to blend our lubricating oil in a much more satisfactory manner with the use of your units than I have obtained before. Your equipment has been satisfactory from every standpoint, and our oil products have proven the advisability of the use of good equipment. I have also been able to save considerable time in our blending operations due to the quick heating facilities and the double mixer attached to these units."

"Due to the fact that we are able to heat and cool our material in the same kettle the time of making a batch has been reduced from three days to one day. We have done this for the past five years without any trouble whatsoever."

These three customers have only reported results well-known to all users of "DOPP" Seamless Leakless Jacketed Kettles (1-1000 gallons) and Mixers (16 styles).

ADOPT THE DOPP Write for your copy of Catalog No.7 ADOPT THE DOPP

Dopp Mixer With Steel Belt to Increase Capacity



Style D Bridge Type Preferred for Grease

NEW YORK BOSTON **SOWERS MANUFACTURING COMPANY** TORONTO MONTREAL
1305 Niagara St., Buffalo, N. Y.

Standard Method To Test Shales Devised

WASHINGTON, Dec. 6.—Information regarding apparatus and methods for testing oil shale and shale oil developed by the Bureau of Mines is contained in a manual, Bulletin 249, just issued by the Bureau.

In order to study the principles that govern the retorting of oil shales and to test the oils produced, it was necessary to develop and standardize reliable apparatus and methods for distilling shale, and to adapt to the testing of shale oils some of the methods the Bureau of Mines uses for testing petroleum. Many retorts now used in oil-shale assaying are unreliable and give misleading results. Furthermore, no comprehensive method for the examination of oil shale or shale oil has yet been adopted by the shale industry. To assure convenience and accuracy in rapid assays in the laboratory and in field tests and to provide a basis of comparison between assays made by other methods, a standardized retort and standard methods of testing are necessary. The Bureau hopes that this report will supply the information needed.

Although the Bureau of Mines has only begun large-scale experiments with oil shales, and the feasibility of the commercial manufacture of shale-oil products suited to present market requirements has not been demonstrated, there is ample reason to believe that these products will eventually supplement the more commonly used petroleum products and give equally good service.

The bulletin may be obtained from the Bureau of Mines, Department of Commerce, Washington.

Texas Co.'s Asphalt Chemist Dies

HOUSTON, TEX., Dec. 6.—Albin H. Schenk, chemist in charge of asphalt testing at the Bayonne, N. J., laboratory of The Texas Co., died on Oct. 4 after a two weeks' siege of pneumonia. He was 51 years old.

Mr. Schenk had been with the company for 14 years, coming to this country from Germany in 1909. He had been a loyal employe and his practical and technical knowledge of asphalt products had made him a valuable member of the company.

CLARK, S. D.—A sales meeting for truck salesmen of the Standard Oil Co. of Indiana in Watertown, S. D. territory, was held on Nov. 9 at the Lincoln Hotel, Watertown, by the Huron branch of the Standard. A talk on lubricating oil was delivered by F. R. Newman, special lubricating oil salesman at Huron. Others attending from Huron included: C. L. Bailey, manager; J. H. Hay, assistant manager; and H. H. Miller, chief clerk.

New Equipment for Plant Improvement

Personal Notes of the Manufacturers

National Petroleum News

Westcott & Greis, Inc., Tulsa, manufacturer of measurement and control equipment for gas in pipe lines and at plants, has off the press a new catalog which recounts the history of the company from the time it began in business 25 years ago up to date.

In the oil and gas fields of Chanute and Independence, Kan., H. P. Westcott and H. N. Greis obtained their experience which led them to develop first the Westcott large-Capacity meter and the Orifice meter. This was turned over to the Metric Metal Works of the American Meter Co., at Erie, Pa. for manufacture.

Due to Mr. Westcott's death two years ago, the company incorporated under its present name, Mr. Greis remaining as president. J. H. Satterwhite, the present general manager, has been with the company seven years. In 1911 while Mr. Satterwhite was with the Peoples Natural Gas Co. at Pittsburgh, he was engaged on the original tests for establishing co-efficients for orifices in pipe lines.

Branch offices and stocks have been established at Dallas, Tex. and at Los Angeles. Besides the distribution and service of measurement and control devices, the company also makes a line of conservation and safety tank equipment.

* * *

Lewis-Shepard Co., Watertown Station, Boston, Mass., manufacturer of Jacklifts, stackers and steel frame platforms, began manufacture of a new steel frame lift truck platform on Nov. 1, designed for use by manufacturers, warehousemen and distributors. Some of the features of the new platform are that the clearance from the underside of the platform to the floor is the same on both sides and both ends permitting a lift truck to be backed in under either side or either end; it is steel bound all around; the steel frame is a unit in itself and does not depend on the clamping of the steel frame and feet to the wood top for strength or rigidity; the entire metal structure is arc-welded and the top of the platform is flat.

* * *

General Electric Co., Schenectady, N. Y., has placed on the market a new design of automatic arc welder, which, it claims, welds with smoothness, speed and accuracy. The operator needs only to push a button to start the sequence of operations producing the weld without any further effort or skill on his part. It is also claimed that the new equipment will perform the welding operations more rapidly and with a greater degree of accuracy than is possible by expert hand operators.

A. E. Davenport of Maywood, Ill., president and general manager of Oil Products Appliance Co., accompanied by Mrs. Davenport, recently spent two weeks hunting in New Brunswick. The trip was a complete success. Mr. Davenport brought down the moose by which he is standing in the accompanying picture, and he killed the biggest bear shot in the Canadian woods this year, both on the same day. Before becoming identified with Oil Products Appliance Co., Mr. Davenport was in charge of construction and equipment for The Texas Co.

A. O. Smith Corp., Milwaukee, Wis., manufacturer of pressed steel products, has announced the transfer of B. F. Bart, who was recently district sales manager at Los Angeles, to the home office at Milwaukee as assistant sales manager of the oil field division. Edward A. Livingstone succeeds Mr. Bart at Los Angeles.

Mr. Bart claims a wide acquaintance in the oil industry, as well as experience in metallurgical engineering. After graduation from Penn. State University as a metallurgical engineer, Mr. Bart has been employed at the National Tube Co.; at the American Iron & Steel Institute, Washington, and previous to his connection with the A. O. Smith Corp., he was New York district sales manager of the Standard Seamless Tube Co.

* * *

The Brown Instrument Co., Philadelphia, has brought out a new electric steam flow meter which is described in an illustrated folder just sent out by the company. A return postcard that goes with the folder gives the recipient a chance to mail in a request for the Brown 62 page catalog, No. 20, which describes the flow meter in detail. This flow meter is claimed to be the only one that operates on the inductance bridge principle.

* * *

General Electric Co., Schenectady, N. Y., has appointed Burton L. Delack as assistant manager of the Schenectady works, effective Dec. 1. Mr. Delack was formerly assistant manager at Erie, Pa. John St. Lawrence, general superintendent at Erie, succeeds Mr. Delack there.

Revolvator Co., Jersey City, N. J., manufacturer of portable elevators, lift-trucks and barrel racks, has published bulletin No. 90-D, covering its worm gear drive, electric portable elevator designed to furnish better control of the platform in descending. As the worm gear is self-locking, the platform has to be driven down by the motor and its descent is stopped when the motor is shut off.

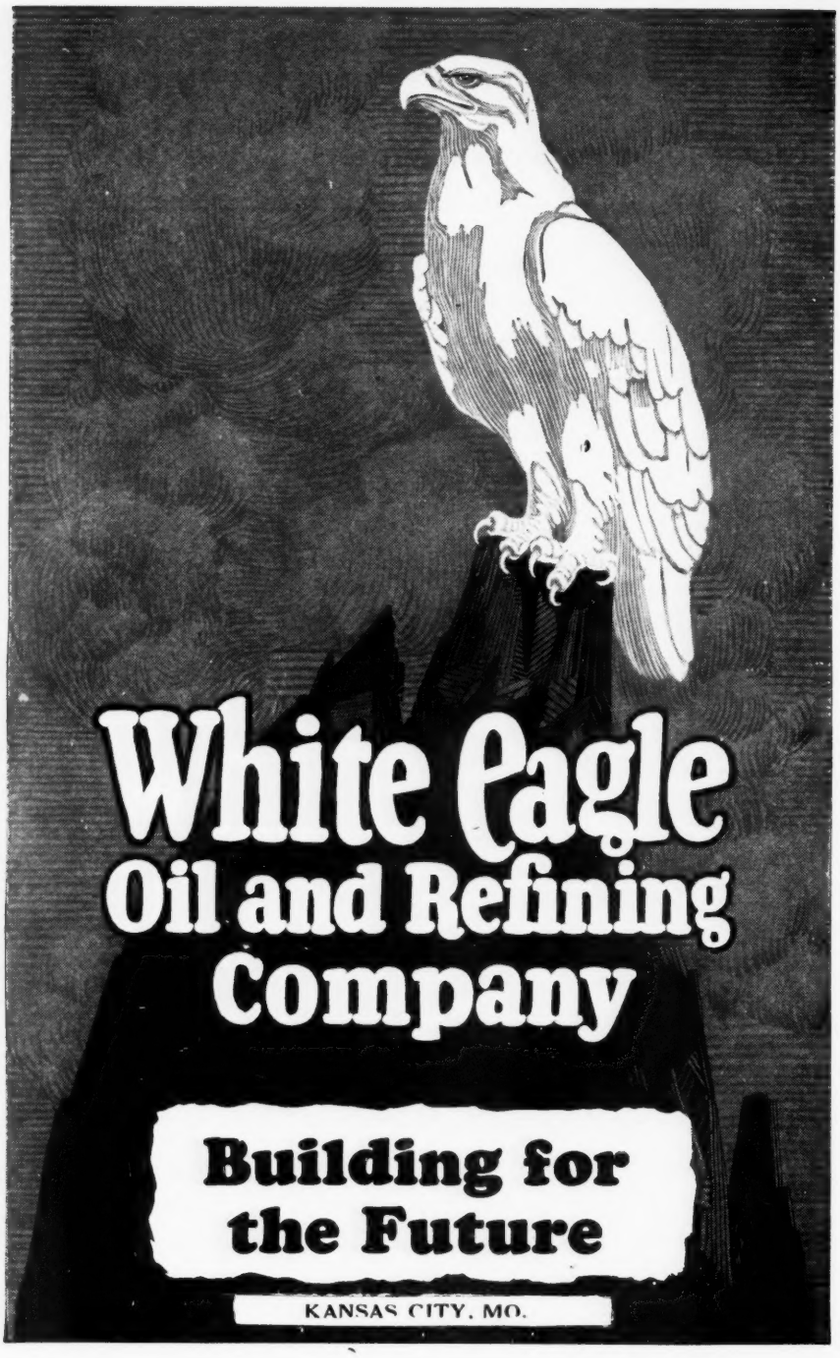
The silent chain driven Revolvator which the company also makes, has the added advantage of higher speed. Its non-revolvable model is also described, and capacities, dimensions and specifications are given.

* * *

Cliff Lord, general manager for Buck & Stoddard, supply concern of Los Angeles, Nov. 3 had his feet on his desk in a brand new office—310 Union Oil Bldg. He said he was happy, and that business was good. This concern recently established a material yard in the harbor district and moved its offices up town so Lord, Stoddard and the rest of the bunch would be closer to general affairs.

* * *

United Oil Well Supply Co., Bartlett Bldg., Los Angeles, describes the uses of a new chemical in a folder just from the press. The chemical is called Demulso and is used to separate oil from water. It is marketed in 50 gallon drums. It has been found especially successful in the Rosecrans field in California in treating refuse oil, such as tank settlings, sump drainage, etc. The folder will be mailed to those interested.



BETHLEHEM
WAX PLANT EQUIPMENT

Filter Presses — *Wax Moulding Presses*
Wax Distillate Chilling Machines — *Scale Wax Cooling Drums*
Wax Testing Presses — *Paraffine Wax Sweater Plants*
Complete Wax Plants designed and built
Pumps, Stills, Towers, Condensers and other Oil Refinery Equipment
Oil Burning Systems — *Complete Power Plant Equipment*

BETHLEHEM STEEL COMPANY, *General Offices, Bethlehem, Pa.*

District Offices

New York Boston Philadelphia Baltimore Washington Atlanta Pittsburgh Buffalo
Cleveland Detroit Cincinnati Chicago St. Louis San Francisco
Los Angeles Seattle Portland

Okla. Geological Survey Publishes Bulletins

Staff Special

TULSA, Dec. 6.—The Oklahoma Geological Survey is compiling an extensive bulletin on Oil & Gas in Oklahoma, it is announced by Charles N. Gould, director. So that the information may be available as it is prepared the survey is issuing Bulletin No. 40 in chapters. Thus far six chapters have been completed.

Following is a list of the recent publications of the survey with brief description and price. The Oklahoma law requires that all bulletins be sold. Copies may be had by addressing the Oklahoma Geological Survey at Norman.

Bulletin 4, Coal in Oklahoma. This bulletin covers the history, production, location, etc. of the coal beds of the state, and contains besides numerous illustrations and maps of coal areas, a table of analyses of the various coals. Price 85 cents.

Bulletin 32, Geology of Southern Ouachita Mountains, Oklahoma. This bulletin deals with the stratigraphy, structure and physiography, history, geography, and economic geology of the region. Profusely illustrated with photographs, charts, and maps. Price $1.10.

Bulletin 35, Index to the Stratigraphy of Oklahoma. First attempt to index all the stratigraphic formations of the State, showing nomenclator, type locality, character, thickness, occurrence, age, correlation, and citations in the literature of the 125 formations in the State. This report is supplemented with a list of characteristic fossils. Price 57 cents.

Bulletin 37, Geology of Texas County, Oklahoma. Like Bulletin 37, this report covchapters which deal in some detail with the geography, physiography, stratigraphy, water and mineral resources, agriculture, and history of the region. One map. Price 57 cents.

Bulletin 38, Geology of Beaver County, Oklahoma Like Bulletin 37, this report covers thoroughly the topography, geography, geology, and stratigraphy of the County. Supplemented with chapters on the fossils, water and economic resources, agriculture, and history of the region. Price 57 cents.

Bulletin 39, Geology of Marshall County, Oklahoma. This report deals with the physiography, stratigraphy, structure, economic geology, agriculture, history, and paleontology of the region. Illustrated with photographs, charts, and one map. Price 57 cents.

Bulletin 40, Oil and Gas in Oklahoma, is being issued as separate chapters. The following have been printed, and the price of each is 30 cents postpaid.

40-A. This report treats the location. geography, topography, stratigraphy, and regional and economic geology of each of the following counties in northwestern Oklahoma: Alfalfa, Woods, Harper, Major, Woodward and Ellis. 4 charts and one map.

40-B. Subsurface stratigraphy of northeastern Oklahoma. Chapters on the pre-Chattanooga formations including the Arbuckle limestone, Burgen sandstone, Tyner

formation, Sylvan shale, etc. One map and one cross-section.

40-C. Oil and Gas in Creek County, Oklahoma. A treatise on the areal geology, stratigraphy, structure, relation of future development to structure, and oil and gas development in this prolific oil producing region. Photographs, charts, and maps.

40-D. Subsurface stratigraphy of western Oklahoma. Discussion of the various formations with special chapter on the structure of the region. Map and one chart.

40-E. Oil and Gas in Stephens County, Oklahoma. Topography, stratigraphy, structure, and production of this important oil producing county. Special chapters on the location, history, stratigraphy, structure, producing sands, future possibilities, etc. of the principal pools in the County.

40-F. Oil and Gas in Okmulgee County, Oklahoma. This county has more oil wells than any other county in Oklahoma. The entire subject is discussed. Illustrated with types of producing structures and a map showing fields.

C. E. Doud To Leave the Oil Business

Staff Special

CHICAGO, Dec. 2.—C. E. Doud, Lynch-Clarisey Co., Chicago, has announced that he will not be identified with the oil industry after Dec. 1. In four years of active business association with the oil trade in Chicago, Mr. Doud has made many friends and won considerable recognition in the oil fuel industry. After Dec. 1, he will be treasurer of the Metal Door & Trim Co., La Porte, Ind., and will move to La Porte.

Mr. Doud entered the oil burning industry in 1917 as Chicago manager for Strong, Carlisle & Hammond Co., Cleveland, O., manufacturer of industrial oil-burning furnaces. In 1923 he accepted a position as manager of the fuel oil department of Lynch-Clarisey Co., already prominent among Chicago lubricating oil compounders and industrial fuel oil jobbers. He remained with the firm until his recent resignation. He was promoted to general sales manager on Oct. 1 this year.

The active management of the fuel oil department of Lynch-Clarisey is now in the hands of G. B. Reith, with the title of sales manager of the fuel oil department. Mr. Reith has been with the firm for several years and has wide experience marketing fuel oil in Chicago.

ROSCOMMON, MICH.—H. Bertl, proprietor of Bertl's Garage expects to install a railroad switch here along side of which he will install a bulk station with one 15,000 gallon tank to begin in the oil business in the spring. The business will be conducted under the name of Roscommon Gas & Oil Co. George Smith is the other member of this partnership.

Western Oil & Refining Uses Two Sweetlands

ONE filter handles kerosene, the other gasoline. Both in combination with the contact process.

Maybe it is the filtering of fine clay that keeps this process out of your refinery.

If so, use a Sweetland.

UNITED FILTERS CORPORATION

Hazleton, Pa.—Los Angeles Office, Central Building
Other Offices in Chicago, New York, Salt Lake City
Export Office: 25 Broadway, New York. Code Address: Unifilter, N. Y.

A Hose Nozzle Valve *must* have SPEED in delivering gasoline. Hundreds of Filling Stations using the Buckeye Type "H" Valve testify to its fast delivering qualities.

This Valve meets all requirements of the Underwriters' Laboratories. It is made in 1" and 1¼" sizes and is being furnished as *regular equipment* by the leading Pump Manufacturers. High grade brass is used throughout its construction. Use the coupon below to get complete details.

Buckeye Iron & Brass Works
356 East Third St. Dayton, Ohio
Manufacturers of Quality Brass Goods since 1860

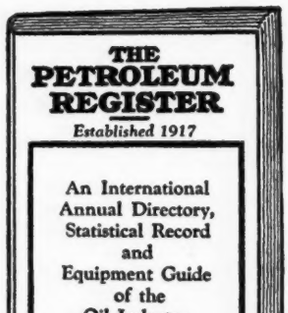
Mail this Now!

BUCKEYE

BUCKEYE IRON & BRASS WORKS.
356 E. Third St., Dayton, Ohio
Please send me further information and prices for Buckeye Service Station Equipment.

Name.....

Address.....



The Petroleum Register 1926

is now off the press, with hundreds of new listings. It combines in one book the following:

A comprehensive directory of equipment used in the oil business, with names and addresses of manufacturers and dealers—

Refiners — officers, capital stock, properties, summary of latest financial report—

Producers—thousands of companies engaged in producing and exploring for oil—

Marketers and jobbers—compounders, grease and natural gasoline manufacturers, pipe line companies, drilling contractors and foreign companies.

Two new features — an alphabetical directory of executives of leading oil companies and their positions. Reproductions of lease forms used by producers and prospectors.

Also Statistical Section; Refinery and Natural Gasoline Plants; Trade names of leading brands of petroleum products; Secretaries and headquarters of oil associations.

National Petroleum News
804 Caxton Bldg.
Cleveland, Ohio

Here is my check for $10 for the June 1926

PETROLEUM
REGISTER

_____

_____

_____

Here & There

National Petroleum News

Edwin J. Freeman, well known in oil marketing circles, has just gone with the Security Petroleum Co. of Kansas City of which E. F. Bergolte is president, to take charge of the Chicago office. He has opened the office in room 820 Blum Building at 624 South Michigan Avenue. Mr. Freeman for the past three years has been operating on his own account as a wholesale marketer at Tulsa. Prior to that he was with a number of prominent oil marketing companies.

* * *

Charles W. Levy, who joined The Texas Co. as salesman at Birmingham, Ala., in 1910, is entering his seventeenth year selling Texaco products. Mr. Levy has sold the entire line of Texaco products but has specialized in the sale of Aleph and Olympian oils. He is known to the trade as "Salesman 504" but the origin of this sobriquet is not known to everybody.

* * *

M. F. Bunday, Brude, S. D., who is marketing White Eagle 60 gravity gasoline for winter use, reports "more ducks in this part of South Dakota than we have seen for years." Mr. Bunday says that the corn fields are alive with big mallards and one can shoot the limit, which is 15, in a short time—providing perhaps, that one is not too aimless a shooter.

* * *

E. B. Ballanger, who is well known in Greenfield, Ind., territory oil trade, has been added to the staff of Otto Rettig & Son, Greenfield. Mr. Ballanger will handle the company's tank wagon business. The company is handling Lincoln motor oils and gasoline.

* * *

O. W. Ice, auditor at Philip, S. D., for the Standard Oil Co. of Indiana, Chicago, S. H. Ryan, lubricating engineer, and H. D. West, agent, both of the same company, have brought home deer as a result of a hunting trip in Black Hills, S. D.

* * *

Robert Dott, formerly a member of the geological staff of the Carter Oil Co., Tulsa, has joined the Mid-Continent Petroleum Corp., Tulsa, to engage in microscopic work in geology.

* * *

George W. Remensnyder, president of the Franklin Refining Co., Pittsburgh, Pa., recently returned from an 8000 mile trip through Canada and the Pacific coast. He was accompanied by Mrs. Remensnyder.

* * *

L. L. Grounds, of the Supreme Oil Co., Indianapolis, Ind., has been placed in charge of the company's new bulk station at Martinsville, Ind.

G. B. Ingram has established a general oil brokerage at 1128 Brant Ave., N. W., Canton, O., for Wenger & Co., Chicago. Mr. Ingram formerly represented the Wenger, Armstrong Co. at Canton but when the Canton office was closed he became sales manager of the Pavania Oil Co., Warren, Pa. Until Oct. 1 he was a year with Cities Service Refining Co., at Boston.

* * *

L. M. and J. D. LeCron, who formerly operated a service station at Council Bluffs, Ia., have purchased the Front and Laurel St. station in Santa Cruz, Calif., and the Evergreen station in San Jose, Calif. Mr. L. M. LeCron will be in charge of the stations. It is expected that several additional stations will be acquired in that territory.

* * *

Howard M. Harris, Cadillac, Mich., a partner of Harris Bros. and also a partner in the Soo Oil Co. of that city, has been in Sault Ste. Marie, Mich., with Mrs. Harris on their annual deer hunting trip. Mr. Harris brought in a 150-pound buck on his first day's outing, according to G. N. Lentz, manager of the Soo Oil Co.

* * *

D. D. McLennon, city salesman at Tulsa for The Texas Co., has been transferred to Henryetta, Okla. as agent for that company.

W. F. Mitchell, formerly agent for the company at Henryetta, has been transferred to Chickasha, Okla. as representative.

* * *

William F. Arndt, formerly engineer of the California Petroleum Co. of California, recently joined the sales division of the F. H. Webber Oil Co., Cleveland. Mr. Arndt was one of the first engineers to join the California company, according to F. H. Webber.

* * *

F. B. Taylor has just been appointed agent and general salesman at Spartanburg, S. C. for the Standard Oil Co. of New Jersey. J. H. Young has been made lubricating engineer at the Charleston, S. C. branch, effective Nov. 10.

* * *

J. Paul McKee, a recent graduate of the State University of Iowa, has become a member of the geological department of The Texas Co., Tulsa. Mr. McKee is assistant geologist.

* * *

J. S. Hudnall and G. W. Pirtle, consulting geologists, have recently opened offices at Brownwood, Tex.

* * *

Sam McIntyre has been promoted to service station manager of the Tresler Oil Co., Cincinnati.

New Oil Patents Issued Recently

Production

Rotary Reamer.—Alexander Boynton, San Antonio, Tex. Filed July 20, 1925. No. 1,607,662.

Crown Block.—Alexander Boynton, San Antonio, Tex. Filed Apr. 27, 1925. No. 1,607,663.

Milling Tool for Well Drilling.—Harold W. Fletcher, Houston, Tex. Filed Oct. 1, 1926. No. 1,607,732.

Detachable Rotary Bit.—Charles T. Dougherty, deceased, by Winfield W. Smith, administrator, Coalinga, Calif., assignor of six fifty-fifths to Hattie E. Dougherty, six fifty-fifths to E. H. Dougherty, and six fifty-fifths to F. C. Dougherty, all of Huntington Beach, Calif.; six fifty-fifths to C. C. Campbell, Coalinga, Calif., six fifty-fifths to R. L. Johnston, Santa Barbara, Calif., three fifty-fifths to P. A. Campbell, Long Beach, Calif., three twenty-fifths to W. W. Smith, two twenty-fifths to J. H. Dunaway, two twenty-fifths to Ray M. Wagner, two twenty-fifths to Clarence Wagner, and one twenty-fifth to Ethel G. Smith, all of Fresno County, Calif. Filed Mar. 3, 1926. No. 1,607,791.

Bit for Well-Boring Tools.—Leonard Aldrin, Denver, Colo. Filed Apr. 5, 1923. No. 1,607,937.

Apparatus for the Abstraction of Gasoline.—Charles Henry Brown, Breckenridge, Tex. Filed Dec. 5, 1923. No. 1,607,942.

Foundation for Standard Drilling and Pumping Rigs.—William Werner, Mexia, Tex. Filed Feb. 27, 1925. No. 1,607,974.

Method of Recovering Hydrocarbon Oils from Oil Sands and the Like.—Harry H. Armstrong, Los Angeles, Calif. Filed May 15, 1922. No. 1,607,977.

Oil Separator.—James Conway, Drumright, Okla. Filed Dec. 8, 1925. No. 1,608,016.

Oil Pump.—Karl P. Neilsen, Long Beach, Calif. Filed Oct. 8, 1925. No. 1,608,114.

Tubing Bleeder and Anchor.—Erd V. Crowell, Los Angeles, and Leonard A. Watson, Taft, Calif., said Leonard A. Watson assignor to said Erd V. Crowell. Filed Jan. 7, 1926. No. 1,608,167.

Rotary Well-Drilling Machinery.—John Thomson Haywood, Ploesti, Roumania. Filed May 18, 1923. No. 1,608,169.

Cable Cutter for Fishing Tools.—John T. Helbert, Broadway, Va. Filed Aug. 17, 1923. No. 1,608,313.

Pull-Rod Clamp.—Harold Gibson Durnell, Bartlesville, Okla. Filed Jan. 18, 1926. No. 1,608,376.

Refining

Process for Hydrogenating and Cracking Hydrocarbons, Carbonaceous Matters, and the Like.—Friedrich Bergius, Heidelberg, Germany. Filed Apr. 5, 1924. No. 1,607,939.

Apparatus for the Abstraction of Gasoline.—Charles Henry Brown, Breckenridge, Tex. Filed Dec. 5, 1923. No. 1,607,942.

Process of Converting Oils.—George L. Prichard and Herbert Henderson, Port Arthur, Tex., assignors to Gulf Refining Co., Pittsburgh, Pa. Filed May 6, 1922. No. 1,607,966.

Refining of Hydrocarbon Oil.—Gustav Egloff and Harry P. Benner, Chicago, Ill., assignors to Universal Oil Products Co., Chicago, Ill. Filed Aug. 20, 1920. No. 1,608,089.

Process for Recovering Resinous Bodies from Cracked Petroleum Distillates.—Jacque C. Morrell, Chicago, Ill., assignor to Universal Oil Products Co., Chicago, Ill. Filed Apr. 27, 1923. No. 1,608,135.

Synthesizing Oils.—Almer McDuffie McAfee, Port Arthur, Tex., assignor to Gulf Refining Co., Pittsburgh, Pa. Filed Jan. 13, 1922. No. 1,608,328.

Natural Gasoline

Separation of the Constituents of Gaseous Mixtures.—Claude C. Van Nuys, Cranford, N. J., assignor to Air Reduction Co., Inc., New York, N. Y. Filed Oct. 22, 1924. No. 1,607,708.

Powerful Sales "Pull"

THAT'S what you give your station when you strengthen it with a forceful Flexlume electric day-and-night sign.

Flexlume delivers your sales message farther and more forcefully. Motorists just can't overlook this outstanding sign. From far up and down the street they read its bold, raised glass letters by day and solid, gleaming letters of light by night.

Let us send you photoprints showing Flexlume "pulling" sales for others and an artist's sketch of a sign for your particular business—without obligation.

We also build exposed lamp and other types of electric signs for those who prefer or require them.

FLEXLUME CORPORATION

1120 Military Road Buffalo, N. Y.

Flexlume Offices All Principal Cities

Factories also at Detroit, Los Angeles, Oakland, Calif. and Toronto, Can.

The Mark of Quality

STANDARD TANKS

YOUR TANK—

is probably right here awaiting your order.

A large assortment of STANDARD SUPER TANKS always on hand.

STANDARD BOILER & PLATE IRON CO.

at NILES, OHIO.

Put OIL in the SHOW WINDOW

ONLY a small part of a retail store is occupied by windows. Yet 85% of the average store's rent is paid for that space. Merchants know that windows are worth their cost, for good display multiplies sales.

Your filling station show window is the little space around the gas pumps. Why not take advantage of this space to display your most profitable merchandise. Use it to show oil in Rhodes Dispensers and you too can increase your sales.

Rhodes Dispensers are visible and show the attractiveness of oil color. Prefilled and premeasured, instantly ready for use, they sell more oil by offering the fast service that every motorist likes.

JAY B·RHODES Co.
KALAMAZOO, MICHIGAN.

COUPON BOOKS

of Every Description

Why not play safe by using ALLISON COUPON BOOKS besides meeting every requirement of good workmanship. They are guaranteed to be accurate.

Write Us for Samples

Allison Coupon Co.

Indianapolis -:- Indiana

New Oil Station Construction

West Middlesex, Pa.—Gulf Refining Co. is completing its bulk station here, which is on a five-acre lot. The station will have a siding on the Erie railroad and will supply oil requirements in Lawrence and Mercer counties. It is on the New Castle-Greenville highway.

A filling station is being built by the Gulf at Sharon which will be completed in about 60 days.

* * *

Arkansas City, Kan.—The Community Oil Co., recently organized by local people with Allan Morrison as president, plans to build and operate a number of filling stations. Offices are in the Walpex Bldg.

* * *

Ashtabula, O.—The Ashtabula Gasoline & Oil Co. is building filling and greasing station on Park St., according to A. R. St. Clair, director of Empire Oil Works, Inc.

* * *

Roscommon, Mich.—Bertl's Garage is completing a bulk station and four service stations, three of which are at Roscommon and one at Houghton Lake, Mich.

* * *

Malcom, Ia.—Charles Campbell is building service station at junction of highways 32 and 59, and will handle Standard Oil Co. of Indiana products.

* * *

Watervliet, Mich.—Watervliet Oil Co. is planning to erect several stations on highway M-17, according to H. G. Hinckley, secretary and treasurer.

* * *

Nashville, Tenn.—W. M. Tatom, agent for The Texas Co. here, is building three service stations, to handle Texaco products.

* * *

Pittsburgh, Kan.—John Friggeri will build service station, which it is reported, will be operated by Hamilton-Preston Oil Co.

* * *

Fond du Lac, Wis.—Two bulk stations will be built here, one each for Red Star Oil Co. and the Glanders Bros. Oil Co.

* * *

McVille, N. D.—George McMillan is building $3,000 filling station to handle White Eagle Oil & Refining Co.'s products.

* * *

McHenry, N. D.—Peterson & Stillwell are completing filling station, which will handle White Eagle products.

* * *

Saginaw, Mich.—Saginaw Oil Co. is building service station here, according to J. G. Schindehette, secretary.

* * *

Anthony, Kan.—Williams Oil Co., with headquarters here, is building two

filling stations, one at Manchester, Okla. and the other at Hazelton, Kan.

* * *

Henrietta, Tex.—Magnolia Petroleum Co. is completing its filling station here.

* * *

Coleraine, Minn.—Standard Oil Co. of Indiana purchased site for garage.

* * *

Two Rivers, Wis.—Wadhams Oil Co. purchased property for filling station.

* * *

West Plains, Mo.—Standard Oil Co. of Indiana to build service station.

* * *

Ardmore, Okla.—Marland Refining Co. to build filling station here.

* * *

Florence, Kan.—W. R. James building filling station on Doyle St.

* * *

San Antonio, Tex.—Gulf Refining Co. will build service station.

* * *

Bellechester, Minn.—Farmers and business men here plan to organize to build filling station.

* * *

Cumberland, Ia.—John Coakley, sheriff of Adams county, purchased property for filling station.

* * *

Cincinnati, O.—Warsaw Filling Stations will erect filling station at Florence & Concord Sts.

* * *

Mineral Wells, Tex.—J. R. Williams is erecting building which will include filling station.

* * *

Davenport, Ia.—Arrow Petroleum Products Co. leased property for service station.

* * *

Norwalk, O.—Paragon Refining Co., Toledo, O., will erect filling station here.

* * *

Florence, Kan.—Marland Refining Co. will erect service station here.

* * *

Rich Hill, Mo.—Standard Oil Co. of Indiana completing filling station.

* * *

Norfolk, Neb.—Continental Oil Co. is building $12,000 service station.

* * *

Junction City, Kan.—Roy Folck is completing filling station.

* * *

Pittsburg, Kan.—George M. McElhenie to build filling station.

* * *

Princeton, Mo.—Martin & Sons completing filling station.

* * *

Richmond, Mo.—Carl Vinsant to erect filling station.

* * *

Cleburne, Tex.—Joe Hughes is erecting filling station.

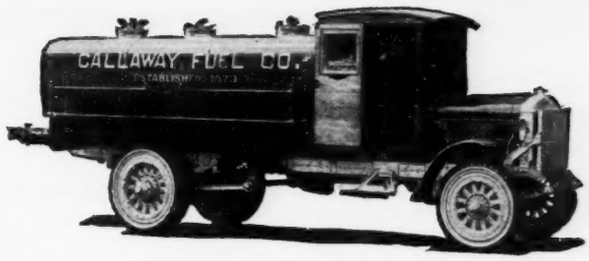
* * *

Chetopa, Kan.—John Shields erecting filling station.

* * *

Tyler, Minn.—Niels Jensen to build filling station.

Heil Tanks
for Motor Trucks



HEIL TANKS for FUEL OIL. This is a 1,200 gallon, 3 Compartment, semi-elliptical fuel oil tank mounted on a 3½ ton 162″ wheelbase Sterling. Heil Fuel Oil Tanks are in service all over the United States. Send for Bulletin 153.

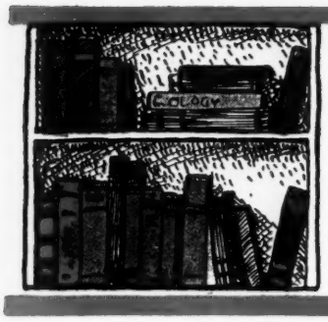
WAVERLY has always used Heil Tanks. The distinctive appearance of this tank gives it unusual value as an advertising medium. Safety features, quick unloading, ease of handling buckets and oil cans, are always given consideration.

This 800 GALLON HEIL TRUCK TANK, semi-elliptical in shape, is mounted on a Federal Knight chassis. It is fitted with side racks, integral can box with side-swing doors, 2″ piping, hinged bumper, and adjustable sills.

Send for our Price List and Tank Catalog.

THE HEIL CO.
1238-50 26th Ave.
Milwaukee, Wis.

FACTORY BRANCHES: CHICAGO, PHILADELPHIA, BOSTON, NEW YORK
One of our Twenty-five Distributors is near you
Manufacturers Steel Dump Bodies, Hoists, and Tanks for Motor Trucks



Oil Man's Bookshelf

YOUR Christmas Greetings with a good book — is a thoughtful way of remembering your friends and associates at Christmas time.

We will enclose a Christmas card signed with your name. All you have to do is to send in the coupon.

If you don't find the book you wish below, write us at once. We have a complete list of the best books on the petroleum industry.

Send your order in at once to avoid the usual Holiday jam in the mails.

ACCOUNTING for the PETROLEUM INDUSTRY

"Accounting for the Petroleum Industry" by D. F. Morland and R. W. McKee, is one of the most practical and comprehensive works on accounting principles and procedure for all branches of the oil industry—production, transportation and storage, refining, marketing.

Accounting for each branch is discussed separately; description of technical practices is given, and the accounting problem to be solved in each activity is set forth together with sample forms in use; tables for depreciation rates, etc.

For refinery accounting this book recommends the "weighted selling ratio method" which is described in detail and which has the advantage of determining for every product a cost which will allow for a reasonable profit when disposition is made thereof.

"Accounting for the Petroleum Industry" is carefully prepared and the most practical book written on the subject of accounting for the oil business.

304 pages—Price $4.00

The second edition of "Deep Well Drilling" by Walter H. Jeffery is just out. The material in the first edition has been rewritten thruout with several new chapters on improvements in the art of drilling.

"Deep Well Drilling" discusses exhaustively cable tool drilling, rotary drilling, core drilling in all their phases; tells how to fish for lost tools; how to case, how to use packers, how to cement and how to shoot; how to plan operations intelligently; specify material, etc.

Every man engaged in the production of oil should have a copy. 648 pages, illustrated, price $6.00.

RECOVERY of GASOLINE from NATURAL GAS

A glance over a few of the chapter headings indicates how thoroughly the author, George A. Burrell, goes into the subject of "Recovery of Gasoline from Natural Gas" in his new book:

Occurrence of gasoline in natural gas—Applying "vacuum" to wells—Gas leases—Chemistry and analysis of natural gas—Testing for gasoline content—Measuring—Gas carrying capacity of pipe lines—Compression method—Absorption process—Charcoal process—Extraction from Residue gas—Blending—Fractionating columns—Depletion—Removal of Hydrogen-Sulfide—Sulfur—Relation between vapor tension and distillation loss—Shipping losses—Gasoline loading apparatus—Insulating gasoline storage tanks—Accidents in transporting—Hazards in gasoline plants—Gas engines and compressors—Horse power required to compress—Steam boilers—Steam engine—Pumps used in gasoline recovery—Water cooling systems—Pipe for natural gas plants—Tanks—Regulators, relief valves, traps, thermostats, meters—Construction and operating costs of plants—Fuel economy—Depletion of properties—Other motor fuels than gasoline—Testing gasoline—etc.
590 pages, 210 illustrations, price $10.

Cut and Mail

National Petroleum News,
878 Caxton Bldg., Cleveland, Ohio.
Send the book checked below as a Christmas gift.

Enclosed is $.....

- ☐ ACCOUNTING FOR THE PETROLEUM INDUSTRY by R. W. McKee $4.
- ☐ DEEP WELL DRILLING by W. H. Jeffery $6.00.
- ☐ RECOVERY OF GASOLINE FROM NATURAL GAS by G. A. Burrell $10.

SEND TO—

Name.....

St.-Box.....

City-State.....

SIGN CARD—

.....

ON THE LAZY BENCH

National Petroleum News

To Be Exact

The witness had been cautioned to give more precise answers.

"We don't want your opinion of the question," the judge told him. "We want it answered—that's all."

"You drive a wagon?" asked the prosecuting attorney.

"No, sir, I do not," was the decided reply.

"Why, sir, did you not tell my learned friend but a moment ago that you did?"

"No, sir, I did not."

"Now, I put it to you, my man, on your oath. Do you drive a wagon?"

"No, sir."

"Then what is your occupation?" asked the State's attorney, in desperation.

"I drive a horse," was the reply.

—Magnolia Oil News

* * *

On the Waiting List

"Well, sir," asked the musician, "what do you think of my compositions?"

"What do I think of them?" said the critic. "Well, they will be played when Gounod, Beethoven and Wagner are forgotten."

"Really?"

"Yes, but not before."

—The Booster

* * *

Referred to the Head Salesman

Voice over the phone at Cincinnati:

"Is Mr. Curtice in?"

"No—but perhaps we can take care of you. What is it you want?"

"Would I be able to get some crude oil from your company?"

"Yes—we will have to take it up with the Refinery Sales Department, but we think that we can take care of you. How much do you want?"

"I'd like to get about a pint to wash my head with."

—The Pure Oil News

* * *

As a transatlantic liner was entering New York harbor, an American passenger proudly pointed out to a Frenchman, who was standing beside him the famous statue of Liberty. The Frenchman gazed and remarked, "We also erect statues to our illustrious dead."

—Magnolia Oil News

* * *

Naughty Revuers

Mary had her baggage searched
By men in quest of custom.
The brutes they soiled her private things,
And, oh, how Mary custom!

—The Pure Oil News

Yet Another Faux Pas

A lady recently telephoned to a well known water works superintendent in a Western City, where, due to the drought, warnings had been issued against waste of water. This lady desired to sprinkle her lawn, but before doing so she thought best to get permission from the water works department.

"What is the proper time to put on my hose?" she asked the superintendent in a very sweet voice.

Before he realized what he was saying, the superintendent replied:

"Immediately after your B. V. D.'s."

—The Loreco Diamond

* * *

Aha!

With a stormy look on his face the master of the house waylaid the servant in the kitchen.

"Look here," he began, angrily, "how dare you tell my wife what time I came home this morning, after I had told you not to?"

The Irish girl eyed him steadily. "Sure, Oi didn't," she replied, calmly. "She asked me phwat toime ye came in an Oi only told her that Oi was too busy gettin' the breakfast ready to look at the clock."

—Magnolia Oil News

* * *

Interesting Coincidence

It was little Flossie's first day at school. Her name had been registered, and the teacher asked, "Have you any brothers or sisters?"

"Yes, ma'am," answered Flossie.

"Are you the oldest one of the family?"

"Oh, no, ma'am," returned Flossie; "father and mother's both older'n me."

—The Booster

* * *

The silver three-penny piece, England's favorite collection plate coin, may be withdrawn in favor of a larger coin, reports London. Mass meetings have already been held in Edinburgh and Glasgow, and resolutions adopted declaring this a dastardly blow at religion.

—Magnolia Oil News

* * *

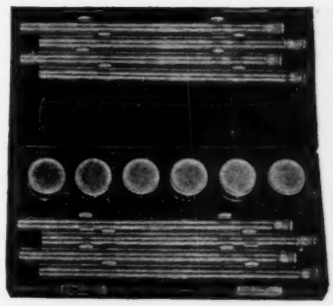
The report that a New York singer who was struck on the head lost his voice was probably started by some wholesale hammer manufacturer.

—The Booster

* * *

We hear of a girl who is the living phonograph of her mother.

—The Booster



A Pocket Sample Case

No. 135 L-U-C-E POCKET CASE is 10⅝"x5¼"x2", fitting conveniently into the side pocket of your coat. Covered with black seal grain, genuine cowhide, with two nickel plated side catches, it assures a favorable first impression. It contains eight 9" x½" bottles and seven ½ oz. grease jars in a compact, convenient manner. The lining is red plush. Complete with your name embossed in gold, *guaranteed* to please, only $6.50

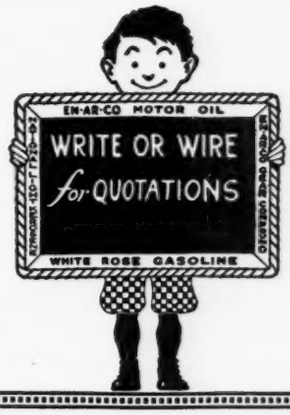
Less 10% for cash.

Other Styles in our FREE Catalog

L-U-C-E

Builders of Sales Luggage

614 Delaware KANSAS CITY, Mo.



The

NATIONAL REFINING COMPANY

PETROLEUM PRODUCTS

THREE MODERN REFINERIES:

Marietta, Ohio Refinery
operated on Pennsylvania Crude

Findlay, Ohio Refinery
operated on Ohio Crude

Coffeyville, Kansas Refinery
operated on Midcontinent Crude

National Headquarters
NATIONAL BLDG., CLEVELAND, O.

Fry Visible Pump

Of the many fine features that go into the make - up of the Fry Visible Pump, one in connection with all the others you can always bank on—that's Fry

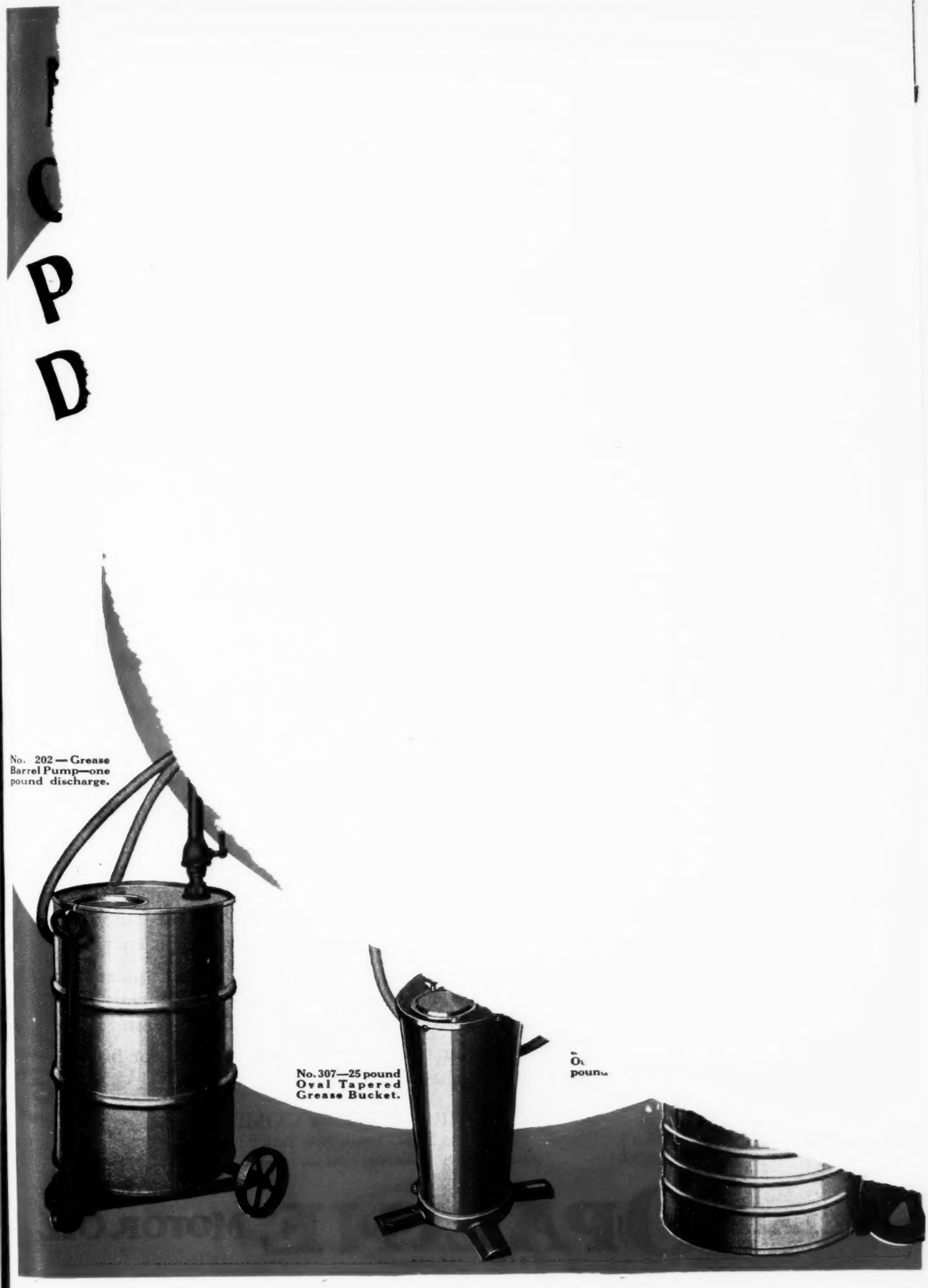
Dependability

Fry's ever increasing volume of sales tells the story

GUARANTEE LIQUID MEASURE COMPANY, Rochester, Pa.

Fry Equipment Co., Ltd., 401 Royal Bank Building, Toronto, Ontario

Jimmy—the Courtesy Man


No. 202 — Grease Barrel Pump—one pound discharge.
No. 307—25 pound Oval Tapered Grease Bucket.

are based on the
mon-sense method
oil to eliminate faulty
sustain engine efficiency.

aline Motor Oil to their regular
method of correct recommenda-
orthwhile part in the "War on Waste"!

ell you more of this sound method for in-
ing your gallonage?

SINCLAIR REFINING COMPANY
45 Nassau Street, New York
Atlanta Detroit Kansas City Chicago Houston Omaha

ring and
acts of quality

SINCLAIR OPALINE MOTOR OIL
REG. U. S. PAT. OFF.

Entire Contents Copyrighted, 1926, By Sinclair Refining Co.

Mid-Continent Gasoline Prices Move Up; Domestic, Export Demand Better

Staff Special

TULSA, Dec. 4

GASOLINE prices advanced ¼ to ½ cent last week in the Mid-Continent as a result of continued export buying of higher gravities and an improved domestic demand for all grades. U. S. Motor in Oklahoma advanced to 9¼ cents before the week closed, as compared with 8¾ to 9 cents at the end of the previous week. Similar advances were made in other areas.

At least two export companies were in the field this week buying 64-66, 375 e.p. gasoline and kerosene, while The Texas Co. was reported to have purchased in excess of 1,000,000 gallons of 60-62, 400 e.p. gasoline. One export company bought a million gallons of 64-66 gasoline in Oklahoma and a similar amount in Texas, paying as high as 10½ cents. This company also bought a million gallons of 41-43 prime white kerosene late in the week.

Various estimates are heard as to the total amount of export material bought recently. A majority of the trade is of the opinion, however, that a conservative estimate is 15,000,000 gallons of both gasoline and kerosene since Nov. 1.

A canvass of the north Texas field shows that refiners are practically sold up for the rest of the year and will have little high gravity gasolines to offer for domestic shipment. Several of them have export orders which permit shipment in January and early February.

Other Refiners Get Orders

TEXAS refiners have not been alone by any means in booking export orders. Several Oklahoma refiners have received orders. A conservative estimate would be around 7,000,000 gallons for this group.

Inquiries have been scarce on low gravity gasolines, a majority of the trade reports. Prices have moved up, however, in step with U. S. Motor. Many plants in north Texas are cutting for 64-66 gravity only, with the result that considerable naphtha is left. They are either selling this for blending purposes or blending themselves, in some instances getting as high as a 60-62 gravity product.

Two or three refiners had advanced their quotations on U. S. Motor in Oklahoma from 9 to 9¼ cents as early as Nov. 26, but others continued to accept business at 8¾ cents even as late as Nov. 30. Material at the lower price, however, was hard to find by Wednesday and a firm 9 to 9¼ cent market had been established. Business continued to improve Thursday and Friday with the result that on Saturday practically every refiner was holding for 9¼ cents, and three quoting up to 9½ cents.

Kansas refiners kept a close watch on Oklahoma and moved their prices up with the Group 3 market although business was not quite so brisk with them.

Considerable over the month selling has been done by Texas refiners, according to reports from that field. This is especially true on U. S. Motor, production of which has fallen off with increased export buying. The result has been that U. S. Motor in Texas is almost on a par with Oklahoma refinery prices.

Arkansas Market Improved

THE Arkansas-Louisiana refiners have not enjoyed the export buying the others have, consequently they did not experience the upward movement as quickly. Arkansas refiners have been sacrificing their usual differential of almost half a cent and accepting a Group 3 price. Orders had increased sufficiently toward the end of the week, however, for them to get almost their normal price.

In addition to The Texas Co.'s buying of 60-62, 400 e.p. gasoline, an exporting company was reported to have purchased some of this grade in Texas. The amount and price were not revealed.

Domestic demand for both 60-62, 400 e.p. and 64-66, 390 and 375 e.p. gasolines has been steadily increasing. Several refiners are now making these grades in Kansas.

Natural gasolines have shown only minor changes throughout the week. Grades A and AA broke from 9¼ cents today, however, with some material moving at 9½ cents. The cooler weather has cut down the production of the A and AA while orders have increased considerably. There has been enough Grades B and BB to take care of the demand, with the result that prices have shown no changes. Grade C has been offered at various prices during the week, with two manufacturers entering the market whenever the price went to 8 cents.

Practically all the smaller manufacturers in Texas are still sold up while the larger ones have booked enough December orders to keep the market stable. One manufacturer yesterday combed the Texas field for 12 cars of Grade AA, having to pay up to 9½ cents per gallon. Grade C is extremely scarce, due to continued heavy movement east, and any material appearing on the market in Texas is picked up quickly. One large manufacturer has had a standing offer of 8¾ cents with a Texas dealer for Grade C.

Export Kerosene Bought

KEROSENES in Oklahoma have shown no changes over the past week. Material of 41-43 gravity has been moving at 6¼ to 6½ cents. The 42-44 w. w. grade has become scarcer, however, and prices have moved from 7 cents flat to a 7 to 7¼ cent range.

Export kerosene buying in Texas this week bolstered the domestic market sufficiently for prices to move up approximately ⅛ cent.

The colder weather through the northern territory has caused a slightly increased demand for stove distillate this week but prices have shown no change. One refiner who has been getting 5¼ cents for his 38-40 straw distillate announced Saturday he was turning down orders at less than 5½ cents.

Gas oil also has shown strength recently. Buyers have had difficulty getting low cold test material this week. Zero cold test gas oil has been practically unobtainable. Most of the material moving has been around 20 to 30 cold test, both for overhead product and the cracked material.

Texas refiners have very little gas oil for immediate shipment, and Louisiana refiners have been behind for some time. One Tulsa marketer had some gas oil moving out of Texas sold to a large purchaser. The material did not come as rapidly as desired and the buyer cancelled. The marketer immediately re-

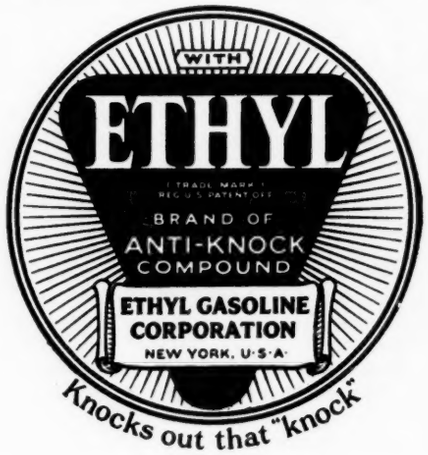
(Continued on page 117)

Beware of imitations of ETHYL GASOLINE

IMITATIONS of Ethyl Gasoline are being offered in a number of localities.

Some are sold under names resembling "Ethyl Gasoline" and have the red color of Ethyl Gasoline. The most flagrant case, perhaps, is that of a concern calling itself "Ethyl Gas Company" and using an alleged trademark resembling ours.

Look for the trademark



For those interested in our product we wish to advise:

1 ETHYL Brand of Anti-Knock Compound is sold only to responsible oil companies licensed by us and having refinery facilities for mixing the Compound with gasoline.

2 THE Compound is never mixed with gasoline in less than tank car lots. Hence, anyone offering an alleged concentrated "anti-knock" fluid for mixing in tank wagons or service station pumps is not offering our product.

3 ETHYL Brand of Anti-Knock Compound is sold only to customers through our office at 25 Broadway, New York. Anyone offering an alleged concentrated "anti-knock" fluid from any other address is not offering our product.

4 ETHYL Brand of Anti-Knock Compound was developed by General Motors Corporation, which owns basic patents covering its invention and use; and we, the Ethyl Gasoline Corporation, are the exclusive licensee for the manufacture and sale of the Compound under the General Motors patents.

5 ETHYL Gasoline is sold to consumers only at pumps which display the trademark which is shown above.

6 ETHYL Gasoline is colored red for identification purposes. *The color has nothing whatever to do with performance.*

ETHYL GASOLINE CORPORATION

25 Broadway, New York City

Refinery Markets on Light Oils and Lubricants

Pennsylvania, Oklahoma, Kansas, North and South Texas, Louisiana, Arkansas, California and New England

GASOLINE AND NAPHTHA

PENNSYLVANIA	Prices Dec. 6	Prices Nov. 29	Prices Nov. 22
52-54 Naphtha	11½-12	11½-12	11½-12
54-56 Naphtha	11¾-12	11¾-12	11¾-12
58-60 Gasoline	11¾-12	11¾-12	11¾-12¼
60-62 Straight-run gasoline	12½-13	12¾-13	12½-13
64-66 Straight-run gasoline	13½-13¾	13½-13¾	13½-13¾
68-70 Straight-run gas.350-360 E.P.	-14½	14 -14½	14 -14½
68-70 Straight-run gas.305-320 E.P.	18 -20	17 -18	17 -18
OKLAHOMA			
48-50 450 E. P. naphtha	8¾- 9	8¾- 9	8¾- 9
50-52 450 E. P. naphtha	8¾- 9	8¾- 9	8¾- 9
56-58 450 E. P. gasoline	- 8¾	8½- 8¾	8½- 8¾
56-58 U. S. Motor gasoline	8⅞- 9	- 8¾	- 8¾
58-60 450 E. P. gasoline	8¾- 8⅞	8⅝- 8¾	8⅝- 8¾
58-60 U. S. Motor 437 E. P.	- 9¼	8¾- 9¼	8¾- 9
60-62 400 E. P. gasoline	10⅛-10⅜	10 -10¼	10 -10⅛
64-66 390 E. P. gasoline	10⅜-10⅝	-10¼	-10¼
64-66 375 E. P. gasoline	10⅝-10⅞	10½-10¾	-10½
68-70 350-360 E. P. gasoline	11¼-11½	11⅛-11¼	11¼-11⅜
64-66 437 E. P. blend	- 9	- 8¾	- 8¾
KANSAS*			
58-60 U. S. Motor gasoline	9⅜- 9½	9⅛- 9⅜	9¼- 9⅜
60-62, 400 E.P. gasoline	10½-10¾	-10¼	10¼-10½
64-66, 375 E.P. gasoline	-11	-10¾	-10¾

*F. O. B. refinery Kansas destination.

NORTH TEXAS			
48-50 450 E. P. naphtha	8¾- 9	8½- 8¾	8½- 8¾
56-58 450 E. P. gasoline	8½- 8¾	8¼- 8½	8¼- 8½
58-60 450 E. P. gasoline	8⅝- 8⅞	8¼- 8½	8¼- 8½
56-58 U. S. Motor gasoline	8⅞- 9	8½- 8⅝	- 8½
58-60 U. S. Motor gasoline	9 - 9¼	- 8¾	8½- 8¾
64-66 390 E. P. gasoline	10¼-10½	10 -10⅛	10 -10⅛
64-66 375 E. P. gasoline	10⅝-10¾	10¾-10½	10¼-10½
68-70 350-360 E. P. gasoline	11¼-11½	11⅛-11¼	11⅛-11¼
NORTH LOUISIANA			
58-60 U. S. Motor 437 E. P.	- 9¼	9 - 9¼	- 9
ARKANSAS			
56-58 450 E. P. gasoline	- 9	- 8⅞	- 8⅞
58-60 450 E. P. gasoline	- 9¼	- 8⅞	- 8⅞
58-60 U. S. Motor gasoline	9⅜- 9½	- 9	- 9
CALIFORNIA			
*54-58 U. S. Motor 437 E. P.	9 - 9½	9 - 9½	9 - 9½
*58-61 U. S. Motor, 437 E. P.	10½-10¾	10⅜-10¾	10⅜-10¾
*42-45 Engine distillate,445-480E.P.	7 - 7½	7 - 7½	7 - 7½

*2c tax to be added if used in state.

NEW ENGLAND (F. O. B. Boston and Fall River)			
58-60 U. S. Motor gasoline	12 -12⅛	-12⅛	-12⅛

NATURAL GASOLINE

(Note: End point of all grades, not over 375° F.)

OKLAHOMA			
Grade AA, 80-87.9 375 E. P.	9¼- 9½	- 9¼	9⅛- 9¼
Grade A, 72-79.9 375 E. P.	9¼- 9½	- 9¼	9⅛- 9¼
Grade BB, 84-92, 375 E. P.	8½- 8¾	8½- 8¾	8⅝- 8¾
Grade B, 76-83.9, 375 E. P.	8½- 8¾	8½- 8¾	8⅝- 8¾
Grade C, 80-90, 375 E. P.	- 8¼	†8 - 8¼	- 8½
NORTH LOUISIANA			
*Grade Double A	9½- 9¾	- 9½	9½- 9¾
*Grade Double B	9⅜- 9½	- 9	- 9¼
*Grade C	9 - 9¼	- 8½	- 9

*F. O. B. Monroe District.

NORTH TEXAS			
*Grade Double A	- 9½	- 9⅜	- 9¼
*Grade A	- 9½	- 9⅜	- 9¼
*Grade Double B	- 8⅞	8¾- 8⅞	8¾- 8⅞
*Grade B	- 8⅞	8¾- 8⅞	8¾- 8⅞
*Grade C	- 8¾	- 8¾	8⅝- 8¾

*F. O. B. Breckenridge.

CALIFORNIA			
75-85, 375-390 E. P. blend	10½-11⅛	10½-11⅛	10⅜-11⅛
PENNSYLVANIA			
68-70 Grav. 437 E. P. blend	12¼-12½	12½-12¾	12¼-12½
64-66 Grav. 437 E. P. blend	12 -12½	12¼-12½	12¼-12½
60-62 Grav. 437 E. P. blend	12 -12½	12¼-12½	12¼-12½
68-70 Grav. 420 E. P. blend	12¼-12½	12½-12¾	12½-12¾

BURNING OILS

PENNSYLVANIA			
45 Water White Kerosene	8 - 8¼	8¼- 8½	- 8¼
46 Water White Kerosene	8½- 8¾	8¾- 9	8¾- 9
47 Water White Kerosene	9 - 9¼	9 - 9½	9 - 9½
OKLAHOMA			
41-43 Water White Kerosene	6¼- 6½	6¼- 6½	6¼- 6½
42-44 Water White Kerosene	7 - 7¼	- 7	6¾- 7
KANSAS			
41-43 w. w. kerosene	- 6¾	6¾- 7	6¾- 7
42-44 w. w. kerosene	- 7½	7½- 7¾	- 7¾
NORTH TEXAS			
40-42 Water White Kerosene	6¼- 6⅜	6 - 6¼	6 - 6¼
41-43 Water White Kerosene	6⅜- 6½	6¼- 6⅜	- 6¼
NORTH LOUISIANA			
41-43 Water White Kerosene	- 7	- 7	- 7
ARKANSAS			
41-43 Water White Kerosene	-	- 7	- 7

*Quotations Only.
†Nominal

CALIFORNIA	Prices Dec. 6	Prices Nov. 29	Prices Nov. 22
38-40 Water White Kerosene	6 - 6½	6 - 6¼	6 - 6¼
NEW ENGLAND			
**40-43 Water White Kerosene	**-10½	**-10¼	**-10¼

NEUTRAL OIL

PENNSYLVANIA (Viscosity at 70° F.)			
200 Vis. No. 3 Assoc. Filt.	28½-29	28½-29	28½-29
180 Vis. No. 3 Assoc. Filt.	-26½	-26½	26½-27
150 Vis. No. 3 Assoc. Filt.	23 -24	23 -23½	23 -23½
(Non-Viscous)			
54 Grav. 350-360 Flash	8 - 8¼	7¾- 8¼	7¾- 8¼
36 Miners Neutrals 300-305 Flash	7½- 7¾	7¾- 7¾	7¼- 7¾

OKLAHOMA (Viscosity at 100° F.)			
100 Vis. No. 2 color	7 - 7½	7 - 7½	7 - 7½
150 Vis. No. 3 color	9 -10	9 -10	9 -10
150 Vis. No. 4 color	- 9¾	- 9¾	- 9¾
180 Vis. No. 3 color	10 -11	10 -11	10 -11
180 Vis. No. 4 color	10 -10½	10 -10½	10 -10¾
180 Vis. No. 5 color	10 -10¼	10 -10¼	10 -10¼
200 Vis. No. 3 color	10¾-11¾	10¾-11¾	10¾-11¾
200 Vis. No. 4 color	-11¾	-11¾	-11¾
200 Vis. No. 5 color	9¾-11¼	9¾-11¼	9¾-11¾
220 Vis. No. 3 color	12 -13½	12 -13½	12 -13½
220 Vis. No. 4 color	-13	-13	-13
220 Vis. No. 5 color	12 -12¾	12 -12¾	12 -12¾
240 Vis. No. 3 color	14 -15	14 -15	14 -15
240 Vis. No. 4 color	-14½	-14½	-14½
240 Vis. No. 5 color	13 -14	13 -14	13 -14
280 Vis. No. 3 color	16 -17	16 -17	16 -17
280 Vis. No. 4 color	-16½	-16½	-16½
280 Vis. No. 5 color	15 -16	15 -16	15 -16
300 Vis. No. 5-6 color	-17	-17	-17

GULF COASTAL (Viscosity at 100° F; cold test 0)			
100 Vis. No. 2 Color Unfilt. Pale	8 - 9	8 - 9	8 - 9
200 Vis. No. 3 Color Unfilt. Pale	11 -12	11 -12	11 -12
300 Vis. No. 3 Color Unfilt. Pale	12 -13	12 -13	12 -13
500 Vis. No. 3½ Color Unfilt. Pale	14 -15	14 -15	14 -15
750 Vis. No. 4 Color Unfilt. Pale	17 -18	17 -18	17 -18
200 Vis. No. 5½ Color Red Oil	9 -10	9 -10	9 -10
300 Vis. No. 5½ Color Red Oil	10 -11	10 -11	10 -11
500 Vis. No. 6 Color Red Oil	12 -13	12 -13	12 -13
750 Vis. No. 6 Color Red Oil	15 -16	15 -16	15 -16

CALIFORNIA (Viscosity at 100° F.)			
100 Vis. No. 2 color	9½-10	9½-10	9½-10
100 Vis. No. 3 color	8 - 8½	8 - 8½	8 - 8½
200 Vis. No. 3 color	10 -10½	10 -10½	10 -10½
300 Vis. No. 3 color	11 -11½	11 -11½	11 -11½
450 Vis. No. 3½ color	13 -13½	13 -13½	13 -13½
550 Vis. No. 3½ color	15 -15½	15 -15½	15 -15½
600 Vis. No. 3½ color	15½-16	15½-16	15½-16
100 Vis. No. 5 color	7 - 7½	7 - 7½	7 - 7½
200 Vis. No. 5 color	9 - 9½	9 - 9½	9 - 9½
300 Vis. No. 5 color	9½-10	9½-10	9½-10
400 Vis. No. 6 color	11½-12	11½-12	11½-12
500 Vis. No. 6 color	12 -12½	12 -12½	12 -12½
600 Vis. No. 6 color	12½-13	12½-13	12½-13
700 Vis. No. 7 color	14½-15	14½-15	14½-15

CYLINDER STOCKS

OKLAHOMA			
190-200 Vis. at 210° Bright Stock	31 -35	31 -35	31 -35
150-160 Vis. at 210° Bright Stock	27 -31	27 -31	27 -31
600 E Stock 140-150 Vis —210°	18 -20	18 -20	18 -20
600 Steam Refined Olive Green	8 -11	8 -11	8 -11
600 Steam Refined Dark Green	5½- 7½	5½- 7½	5½- 7½
Black Oil	5 - 6	5 - 6	5 - 6
PENNSYLVANIA (1-inch Immersion Test)			
600 Steam Refined	11 -11½	11 -11½	11 -11½
650 Steam Refined	15½-16	15½-16	15½-16
600 Flash	19½-20½	20 -21	20 -21
625 Flash	-30	-30	-30
600 Warren E	20 -20½	20 -20½	20 -20½
600 Oil City E	18½-19½	18½-19½	18½-19½
600 D Filtered	25½-26	25½-26	25½-26
Cold Test Stocks (bright filtered)	37¾-38½	37¾-38½	38¼-39
Cold Test Stock (dark filtered)	36 -37	36 -37	36¼-37

(Note—Prices of total immersion test goods average 1 to 3 cents per gallon higher.)

LONG RESIDUUM STOCKS

PENNSYLVANIA			
60-65 vis. @ 210, 440-450 flash No. 5½ color	-33	-33	-33
70-75 vis. @ 210, 450-455 flash No. 6 color	-34	-34	-34
80-85 vis. @ 210, 440-450 flash No. 7 color	-35	-35	-35
80-85 vis. @ 210, 450-460 flash No. 7-8 color	-36	-36	-36
80-85 vis. @ 210, 460-465 flash No. 7 color	36 -37	36 -37	36 -37
95-100 vis. @ 210, 490-495 flash No. 8 color	-38	-38	-38

**Only one refiner quoting.

Industrial Bond Issues

WE are prepared to purchase entire bond issues of sizeable and sound American industrial and manufacturing companies.

Address our office
at
42 Broadway, New York City

HORNBLOWER & WEEKS

ESTABLISHED 1888

BOSTON	NEW YORK	CHICAGO	CLEVELAND
DETROIT	PROVIDENCE	PORTLAND, ME.	PITTSBURGH

BUILT FOR SPEED

TANKS to be mounted on Bus Chassis capable of high speed must be properly designed. No ordinary tank will do for this purpose. Every BROWN CERTIFIED TANK is custom built and without extra charges. Why don't you send for information at once?

BROWN SHEET IRON & STEEL CO. **ST. PAUL, MINN.**

— — — — — — *Tear out this page and mail it today* — — — — — —

We are interested in your tanks. Send your catalog and prices.

Make of Truck..... Year ..... We operate..... (number) Tank Trucks.

Other equipment on which you may send prices.....

Name..... Address.....

Refinery Markets on Wax and Heavy Oil Products

Pennsylvania, Oklahoma, Kansas, North and South Texas, Louisiana, Arkansas, California and New England

WAX

PENNSYLVANIA	Prices Dec. 6	Prices Nov. 29	Prices Nov. 22
	(Per Pound, New York)		
122-124 White Crude Scale	4¾ - 5	4⅞- 5	4⅞- 5
124-126 White Crude Scale.	5 - 5¼	5 - 5⅛	5 - 5⅛
OKLAHOMA			
124-126 White Crude Scale.	4⅛- 4¼	4⅛- 4¼	4¼- 4⅜
CALIFORNIA			
White Crude Scale.....	6 - 7	6 - 7	6 - 7

FUEL OIL

PENNSYLVANIA			
36-40 Fuel Oil.....	6½- 6¾	6¾- 7	- 6¾
30-34 Fuel Oil.....	- 6½	- 6½	- 6½
28-30 Fuel Oil.....	6⅜- 6½	6¼- 6½	6¼- 6½
OKLAHOMA			
38-40 Straw distillate.....	5¼- 5½	5¼- 5½	5¼- 5½
36-38 Straw distillate.....	5 - 5¼	5 - 5¼	5 - 5¼
32-36 Gas oil cracked (Gal.)	4¼- 4⅜	- 4¼	- 4¼
32-36 uncrackedGas oil,(Gal.)	4⅜- 4½	4¼- 4⅜	4¼- 4⅜
28-30 Fuel oil (Bbl.).....	1.50 -1.60	1.50 -1 60	1.50 -1.60
26-28 Fuel oil (Bbl.).....	1.35 -1.45	1.35 -1.45	1.35 -1.45
24-26 Fuel oil (Bbl.).....	1.27½-1.32½	1.27½-1.32½	1.30 -1.32½
22-26 Fuel oil (Bbl.).....	1.22½-1.27½	1.22½-1.27½	1.25 -1.30
18-22 Fuel oil (Bbl.).....	1.20 -1.25	1.20 -1.25	1.22½-1.25
16-18 Fuel oil (Bbl.).....	-1.20	-1.20	-1.20
14-16 Fuel oil (Bbl.).....	-1.17½	1.17½-1.20	1.17½-1.20
KANSAS*			
38-40 straw distillate.....	5¾- 6	5¾- 6	5¾- 6
36-38 straw distillate.....	5⅝- 5¾	5⅝- 5¾	5⅝- 5¾
32-36 Gas Oil.....	- 4½	- 4½	- 4½
18-22 Fuel Oil.....	1.25 -1.35	1.25 -1.30	1.25 -1.30
24-26 Fuel Oil.....	1.45 -1.55	1.45 -1.55	1.45 -1.55
*F. O. B. refinery, Kansas destination.			
NORTH TEXAS			
38-40 Straw Distillate.....	5 - 5¼	5 - 5¼	5 - 5¼
32-36 Gas Oil (Gal.) cracked	4¼- 4⅜	4⅛- 4¼	- 4⅛
32-36 uncracked gas oil....	4¼- 4⅜	- 4¼	4⅛- 4¼
24-26 Fuel per (Bbl.).....	1.52½-1.55	1.55 -1.57½	1.50 -1.55
GULF COASTAL			
Fuel.....	1.55 -1.60	1.55 -1.60	1.55 -1.60
Gas Oil.....	5¼- 5½	5¼- 5½	5¼- 5¼

NORTH LOUISIANA	Prices Dec. 6	Prices Nov. 29	Prices Nov. 22
32-36 Gas oil, cracked (Gal.)	4⅜- 4½	4⅜- 4½	- 4⅜
32-36 Gas oil, uncracked (Gal.)	4½- 4⅝	4½- 4⅝	- 4½
16-20 Fuel Oil (Bbl.).....	1.17½-1.20	1.17½-1.20	1.15 -1.20
ARKANSAS			
30-34 Gas oil.....	- 4¼	4 - 4¼	4 - 4¼
32-36 Gas oil.....	4¼- 4⅝	4¼- 4½	4¼- 4½
Smackover Crude Fuel....	1.25 -1.27½	1.22½-1.27½	1.22½-1.27½
CALIFORNIA*			
14-18 Fuel Oil (Bbl.).....	80 -1.00	80 -1.00	80 -1.00
14-18 Bunker Oil (Bbl.)...	80 -1.00	80 -1.00	80 -1.00
30-34 Gas Oil (Bbl.).....	1.30 -1.35	1.30 -1.35	1.30 -1.35
27 + Diesel Oil (Bbl.)....	-1.15	-1.15	-1.15
*(San Joaquin Valley, San Fransciso 4c per bbl. more.)			
NEW ENGLAND			
	(F. O. B. Boston and Fall River)		
30-32 Gas Oil (Gal.).....	6 - 6¼	6 - 6¼	- 6
Fuel Oil (Bunker C) Bbl..	-1.83	-1.83	-1.84

PETROLATUMS

PENNSYLVANIA			
Snow White.....	8½- 9	8½- 9	8½- 9
Lily White.....	7½- 8	7½- 8	7½- 8
Cream White.....	- 6½	- 6½	- 6½
Light Amber.....	- 3½	- 3½	- 3½
Amber.....	3½- 3½	3½- 3½	3½- 3½
Red.....	- 3	- 3	- 3
Green —5.....	1¾- 2	1¾- 2	1¾- 2

PETROLEUM COKE

OKLAHOMA

(Per ton in car lots)

Lump.....	$5-$6	$5-$6	$5-$6
Breeze.....	2-2.25	2-2.25	2-2.25
Still Run.....	3.25-3.50	3.25-3.50	3.25-3.50

Above prices are f. o. b. refinery in tank car. They are the prices at which the bulk of the products on the open market move. Whoever has knowledge of any open market prices on any considerable quantity of goods differing from the foregoing, will favor us with this information.

(Continued from page 115)

sold the five cars at an ⅛ cent more than he would have obtained from the original purchaser.

Tank Cars Scarce

FUEL oils have been marking time as far as prices were concerned. The higher gravities have shown a slight increase in demand. One refiner early in the week booked 10,000 barrels of 14-16 gravity fuel at $1.10 in buyers' cars.

The tank car situation has had considerable effect on the fuel oil market. Tank cars have been scarce for practically all purposes. The traffic manager for a natural gasoline concern said this week he has had difficulty getting insulated cars for their products.

A Dallas tank car company's executive has said there would be no dirty cars available from his firm until Jan. 1, when 100 cars would be available, to meet a call for nearly 1000. The movement of Panhandle crude is taking a large portion of the cars.

No changes were noted this week in Oklahoma neutral oil and cylinder stock prices. Wax was unchanged at 4⅛ to 4¼ cents, with orders scarce.

Cold Slackens Gasoline Demand In East

By Special Correspondent

NEW YORK, Dec. 6.—The Atlantic Seaboard gasoline situation failed to improve last week. The cold snap brought about a slump in demand from New York state and Pennsylvania jobbers. Stocks of gasoline are piling up as there is still a fairly heavy influx from California.

New York harbor refiners were generally asking 11½ cents a gallon for U. S. Motor in tank cars at refineries and 12½ cents a gallon in tank cars delivered to the trade. California gasoline was quoted on the same basis, although bulk cargoes are being laid down here at 11¼ cents a gallon. High freight rates are keeping the price up.

Consumption of gasoline is waning and smaller refiners appear more inclined to make concessions. There has been much talk of a reduction in New York and New Jersey gasoline tank wagon prices. Consequently small marketers were inclined to operate on a very conservative basis.

At Gulf ports conditions failed to improve. There was considerable talk of lower tank wagon prices. Consumption in the Gulf states, however, is still fairly heavy. Most refiners were asking 10½ cents a gallon for U. S. Motor in tank cars at the refineries.

Eastern and Central Kentucky Market

ASHLAND & LEXINGTON, KY., Dec. 6.—U. S. Motor gasoline in eastern Kentucky refinery market is steady at 11¾ cents. Higher gravity gasolines have strengthened, prices being ⅛ to ¼ cent higher than a week ago. Kerosene is ¼ cent lower, at 8 cents flat. Prices of other products are unchanged.

Demand for U. S. Motor gasoline in central Kentucky market is better. Other products are steady.

Quotations on Dec. 6 were:

	Eastern	Central
58-60 gasoline	11¾	11¼
60-62 gasoline	12¼	
64-66 gasoline	12⅞	
68-70 gasoline	13⅜	
41-43 w.w. kerosene	8	8⅛
36-38 distillate	6¼	
34-36 gas oil	6	6
24-26 fuel oil	5	5
14-16 fuel oil	4⅝	5

Price Upturn is Significant Chicago Factors Believe

Staff Special

CHICAGO, Dec. 7

FRACTIONALLY higher price of 58-60 U. S. Motor gasoline in the Chicago resale market this week indicates that the corner had been turned, in the opinion of large refiners and marketers. They argued that bottom was reached last week when material sold at 8¾ to 9 cents, and that any change in the near future would be upward in tendency.

In support of this contention it was pointed out that, for the past three years gasoline prices have slumped off in the fall, reached bottom, and began a slow upward climb. One refiner, however, did not support this theory but said he believed there would be no upward price movement in the near future.

U. S. Motor gasoline closed the week a little higher at 9 to 9¼ cents. Monday material moved at 8⅞ to 9 cents with 9¼ cents sales reported Tuesday. The market was 9 to 9¼ cents Wednesday and remained at that level over the balance of the week.

Demand over the week was generally the same as that of the previous week. The trade reported there had been no large jobber buying. One marketer reported encountering two difficulties with his customers this week, (1) fear of a tankwagon change and (2) indecision on whether to buy U. S. Motor or high test gasoline. Most of the trade reported that buyers have overcome fear of a tank wagon change.

Burning oils and high test gasoline demand was steady over the week, gas oil in better demand than distillate, with zero cold test stocks scarce. The 32-36 dark gas oil sold at 4¼ to 4⅜ cents this week with some sales made at 4½ and 4⅝ cents, but the 32-36 straw gas oil price was 4⅝ cents for the week with few sales reported above or below this figure.

Export buying, coupled with steady jobber demand, has firmed the high test market, especially 64-66, 375 e.p. gasoline, the trade reported. Price on 64-66, 375 e.p. material was 10⅝ to 10¾ cents for the first three days of the week, and was 10¾ to 10⅞ cents at close of business Saturday.

The 60-62, 400 e. p. gasoline price ranged from 10 to 10¼ cents early in the week, but firmed at 10¼ cents flat Thursday. Several refiners reported a better demand for the 68-70, 360 e.p. gasoline this year than for a corresponding time last year. Interest in the 60-62, 400 e.p. gasoline has picked up this fall also, it was reported.

Kerosene was inactive over the week. A refiner today said he noted an increased demand for kerosene in Michigan but there was little buying in other places in this district. The 41-43 w.w. kerosene price was steady at 6¼ to 6⅛ cents over the week with some sales made late in the week at 6½ cents.

Low gravity fuels were fairly active with little change in prices. For 18-22 fuel $1.22½ to $1.27½ was the prevailing price with some material sold in the middle of the week at $1.20. The 24-26 grade was $1.32½ to $1.35. Smackover was in good demand, with price steady at $1.27½ to $1.30. Dirty tank cars are scarce, the trade reported, hampering movement of heavier oils.

Much cloudiness with frequent periods of precipitation is the weather prediction for next week in the Chicago forecast district. Temperatures will average near normal.

Gulf Pale Oils Firmer

HOUSTON, Dec. 4.—Gulf Coastal lubricant markets are described by manufacturers as being firmer without changes in recent prices. Greatest demand is for 200 viscosity pale oil, with 300 viscosity also figuring in good movements. The higher viscosity oils, although said to be moving satisfactorily, are in less demand. December business in general is reported to be starting off in excess of expectations. Only the red oils, manufacturers say, show any weakness. Red oils are available in quantity.

PLATT'S
OILGRAM
Petroleum Markets Every Day

1,509 Telegrams in November on Price-changes

DURING the past month, PLATT'S OILGRAM sent 1,509 wires on tank-wagon and crude price - changes to subscribers.

Will oil markets be as unsettled in December?

No one can prophesy the future absolutely, but you can keep posted *daily* on price-changes in the refinery, tank-wagon and crude markets thru PLATT'S OILGRAM.

A sudden advance or decline in tank-wagon or crude may change market conditions decidedly *within a few hours time.*

PLATT'S OILGRAM service by wire and fast mail *every day* will enable you to take advantage of price-movements. Costs $25 for three months, or $75 for a whole year, payable in advance.

Send for your service to the nearest mailing point.

TULSA—608 Bank of Commerce Bldg.
CHICAGO—360 N. Michigan Ave.
CLEVELAND—873 Caxton Bldg.

Week's Price Changes Tank Wagon Markets

Gasoline Changes

Atlantic Refining.—T. w. and s. s. prices gasoline reduced 1 cent, Pennsylvania and Delaware, to 18 cents tank wagon excluding tax, **Dec. 2.** New England points remained unchanged.

Standard of Kentucky.—Savannah, Ga. t.w. and s.s. prices gasoline are officially posted at 18 cents and 20 cents respectively including 4 cent tax, but reports coming from reliable Independent jobers as well as newspaper reports, state that a price war at Savannah brought tank wagon to 16 cents and service station price to 18 cents on **Nov. 29.** The majority of large distributors, including the Standard, are selling at the latter prices, reports state.

Magnolia Petroleum.—Tank wagon differentials of 3 cents on gasoline have again been established in Texas, where t.w. and s.s. prices have been quoted the same since **May 5.**

Continental Oil.—T.w. and s.s. prices gasoline reduced 1 cent, Pueblo, to 19 cents and 21 cents respectively, including 2 cent tax, **Dec. 4.**

Crude Prices Changes

HOUSTON, Dec. 6.—On Dec. 1 Humble Oil & Refining Co. again graded Wheeler county crude in the Texas Panhandle, adopting the same gravity schedule as it had there previous to Oct. 25 when the flat price of $1.25 was put into effect. Its prices in Wheeler county now are 90 cents for 28 to 28.9 degrees gravity, with 5 cents additional for each full succeeding degree of gravity, up to top grade of 44 and above, which is $1.70. These prices are 10 cents below those posted in Gray county. Hutchinson and Carson county crude remains at the flat price of $1.25 for all grades.

Humble is now maintaining three different price schedules in Panhandle.

Motor Benzol Easier

NEW YORK, Dec. 6.—The undertone of the motor benzol market was easier last week. While one or two factors are still asking 24 cents a gallon for spot motor benzol in tank cars at the ovens, most sellers are offering at 23 cents a gallon. Business has been spasmodic and not so good as expected Production is still heavy but consumption is falling and motor fuel blenders are buying only as needed. Production of coke is heavy and there have not been any indications of a fall in production before Jan. 1. Spot stocks of motor benzol are large but marketers say there is little chance of prices going any lower soon.

Tank Wagon, Service Station Markets for Gasoline and Kerosene In United States Territories and Canada

These Prices in Effect Dec. 6, 1926

S. O. NEW JERSEY TERRITORY

	Gasoline T.W.	Tax	Total T.W.	S.S.	Oil T.W.
Atlantic City, N. J.	18	0	18	*	16
Newark, N. J.	18	0	18	20	16
Annapolis, Md.	18	2	20	*	16
Baltimore, Md.	18	2	20	23	16
Cumberland, Md.	18	2	20	23	16
Washington, D. C.	18	2	20	23	16
Danville, Va.	18	4½	22.5	*	16
Norfolk, Va.	18	4½	22.5	25.5	16
Richmond, Va.	18	4½	22.5	25.5	16
Roanoke, Va.	18	4½	22.5	25.5	16
Petersburg, Va.	18	4½	22.5	*	16
Williamsburg, Va.	18	4½	22.5	*	16
Charleston, W. Va.	18	3½	21.5	24.5	16
Clarksburg, W. Va.	18	3½	21.5	24.5	16
Keyser, W. Va.	18	3½	21.5	*	16
Parkersburg, W. Va.	18	3½	21.5	24.5	16
Wheeling, W. Va.	18	3½	21.5	24.5	16
Charlotte, N. C.	19	4	23	26	16
Hickory, N. C.	19	4	23	*	16
High Point, N. C.	19	4	23	*	16
Mt. Airy, N. C.	19	4	23	*	16
Salisbury, N. C.	19	4	23	*	16
Charleston, S. C.	19	5	24	27	16
Columbia, S. C.	19	5	24	27	16

*Dealers set own prices. S. O. New Jersey does not operate station.

S. O. NEW YORK

Due to local price conditions at many points in S. O. New York territory, actual prices on both gasoline and kerosene are being made at under the posted tank wagon prices published below.

*New York City	21	0	21	25	18
Albany, N. Y.	17	0	17	19	18
Buffalo, N. Y.	17	0	17	20	18
Rochester, N. Y.	17	0	17	21	16
Syracuse, N. Y.	17	0	17	19	18
Boston, Mass.	19	0	19	21	18
Augusta, Me.	21	3	24	26	18
Manchester, N. H.	21	2	23	25	18
Burlington, Vt.	20	2	22	24	18

*In steel barrels.

ATLANTIC REFINING

Pittsburgh, Pa.	18	*	18	*23	16
Philadelphia, Pa.	18	*	18	*23	16
Allentown, Pa.	18	*	18	*23	16
Erie, Pa.	18	*	18	*23	16
Scranton, Pa.	18	*	18	*23	16
Altoona, Pa.	18	*	18	*23	16
Dover, Del.	18	2	20	23	16
Wilmington, Del.	18	2	20	23	16
Providence, R. I.	19	1	20	22	18
Boston, Mass.	19	0	19	21	18
Springfield, Mass.	19	0	19	21	18
Worcester, Mass.	19	0	19	21	18
Hartford, Conn.	19	2	21	24	17
New Haven, Conn.	19	2	21	24	18

*2-cent state tax is collected by retail dealer and paid by him directly to state.

S. O. KENTUCKY

Lexington, Ky.	18	5	23	26	17
Louisville, Ky.	17	5	22	25	17
Covington, Ky.	18	5	23	26	17
Clarksdale, Miss.	16	4	20	23	14.5
Gulfport, Miss.	††17.5	4	††21.5	24.5	15
Jackson, Miss.	16	4	20	23	15.5
Natchez, Miss.	15.5	4	19.5	22.5	15
Vicksburg, Miss.	15.5	4	19.5	22.5	15
Birmingham, Ala.	16	2	18	21	17.5
Mobile, Ala.	15	2	17	20	16
Montgomery, Ala.	*17	2	19	22	*18.5
Atlanta, Ga.	†14	3½	18	21	18
Augusta, Ga.	†14	3½	18	21	17
Macon, Ga.	†14	3½	18	21	18
Savannah, Ga.	†14	3½	18	20	16
Jacksonville, Fla.	12	4	16	19	16
Miami, Fla.	14	4	18	21	17.5
Tampa, Fla.	12	4	16	19	16
Pensacola, Fla.	**13	4	**17	20	16.5

*Local privilege tax of 1 cent on gasoline and ½ cent on kerosene at Montgomery included.

†Georgia has ½ cent per gal. inspection fee on gasoline which is deducted as well as the state gasoline road tax of 3½ cents, to get the actual net tank wagon market to dealer.

**Both tank wagon prices include 1c city tax at Pensacola, which went into effect Oct. 15, 1926.

††Both tank wagon prices at Gulfport include special Sea Wall tax of 2c.

S. O. INDIANA

	Gasoline T.W.	Tax	Total T.W.	S.S.	Oil T.W.
Chicago, Ill.	†18	0	†18	20	13.5
Decatur, Ill.	18.2	0	18.2	20.2	14
E. St. Louis, Ill.	17.1	0	17.1	19.35	13.1
Joliet, Ill.	18.4	0	18.4	20.4	14.2
Peoria, Ill.	18.2	0	18.2	20.2	14
Quincy, Ill.	18.2	0	18.2	20.2	13.8
Indianapolis, Ind.	18.2	3	21.2	23.2	14.2
Evansville, Ind.	18	3	21	23	14
South Bend, Ind.	18.4	3	21.4	23.4	14.4
Detroit, Mich.	18.8	2	20.8	22.8	14.7
Grand Rapids, Mich.	18.7	2	20.7	22.7	14.6
Saginaw, Mich.	18.9	2	20.9	22.9	14.8
Green Bay, Wis.	18.6	2	20.6	22.6	14.3
Madison, Wis.	18.3	2	20.3	22.3	14
Milwaukee, Wis.	18.1	2	20.1	22.1	13.8
La Crosse, Wis.	19.2	2	21.2	23.2	14.9
Minneapolis, Minn.	15.2	2	17.2	19.2	15.1
Duluth, Minn.	19.5	2	21.5	23.5	15.1
Mankato, Minn.	19.1	2	21.1	23.1	14.9
Des Moines, Iowa.	16	2	18	20	14 4
Davenport, Iowa.	18.5	2	20.5	22.5	14.4
Sioux City, Iowa.	16.9	2	18.9	20.9	14
Mason City, Ia.	18.5	2	20.5	22.5	14 4
St. Louis, Mo.	*17.6	2	19 6	21.9	13.5
Kansas City, Mo.	††18.9	2	20.9	22.9	12.8
St. Joseph, Mo.	††18.5	2	20.5	22.5	13.4
Fargo, N. D.	20.9	2	22.9	24.9	17.1
Grand Forks, N. D.	20	2	22	24	17.4
Minot, N. D.	20.9	2	22.9	24.9	17.1
Pierre, S. D.	19.5	3	22.5	24.5	15 6
Huron, S. D.	19.5	3	22.5	24.5	15.6
Wichita, Kans.	**16.8	2	18.8	20.8	13.3
Bartlesville, Okla.	16.8	3	19.8	21.8	13.3

†Dumps of 100 or more gallons at 17c per gallon
*Includes city tax of ½c.
††Includes city tax of 1c.
**Dumps of 50 gallons or more in Kansas, 1c discount per gallon.

S. O. NEBRASKA

Crawford, Neb.	19	2	21	*	14.75
Omaha, Neb.	18.25	2	20.25	22.25	14
McCook	19.75	2	21.75	23.75	15.5
Norfolk	17	2	19	21	14.5
North Platte	19.75	2	21.75	23.75	15.25
Scottsbluff	19.25	2	21.25	23.25	14.75

*Standard has no service station here.

CONTINENTAL OIL

Denver, Colo.	18	2	20	21	16
Pueblo, Colo.	17	2	19	21	16
Grand Junction, Colo.	21.5	2	23.5	25.5	19.5
Casper, Wyo.	18	2½	20.5	22.5	14.5
Cheyenne, Wyo.	19	2½	21.5	23.5	16
Butte, Mont.	19	2	21	21	19.5
Helena, Mont.	22	2	24	26	19.5
Salt Lake City, Utah.	20.5	3½	24	26	18
Boise, Ida.	22	3	25	27	20
Twin Falls, Ida.	22	3	25	27	20
Albuquerque, N. M.	20	3	23	26	18.5

S. O. CALIFORNIA

Phoenix, Ariz.	19	3	22	25	21.5
Los Angeles, Cal.	11.5	2	13.5	16.5	15.5
Fresno, Cal.	12.5	2	14.5	17.5	16.5
San Francisco, Cal.	13	2	15	18	15.5
Reno, Nev.	16.5	4	20.5	23.5	19
Portland, Ore.	13	3	16	19	16.5
Seattle, Wash.	13	2	15	18	16.5
Spokane, Wash.	17	2	19	22	20.5
Tacoma, Wash.	13	2	15	18	16.5

S. O. LOUISIANA

Little Rock, Ark.	17	4	21	24	16
Alexandria, La.	17	2	19	22	17
Baton Rouge, La.	16	2	18	21	15.5
Lake Charles, La.	17.5	2	19.5	22.5	17
New Orleans, La.	*16.5	2	18.5	21.5	16
Shreveport, La.	16	2	18	21	16
Lafayette, La.	17	2	19	22	16.5
Bristol, Tenn.	20	3	23	26	17.5
Chattanooga, Tenn.	19.5	3	22.5	25.5	17.5
Knoxville, Tenn.	19.5	3	22.5	25.5	18
Nashville, Tenn.	18	3	21	24	18
Memphis, Tenn.	17	3	20	23	17

*Includes 1c city tax on gasoline and kerosene.

S. O. OHIO

	Gasoline T.W.	Tax	Total T.W.	S.S.	Oil T.W.
All Ohio points	19	2	21	23	17

MAGNOLIA PETROLEUM

Muskogee, Okla.	16	3	19	22	13
Oklahoma City	15	3	18	21	13
Tulsa, Okla.	16	3	19	22	13
Fort Smith, Ark.	17	4	21	24	14.5
Little Rock, Ark.	17	4	21	24	14.5
Texarkana, Ark.	16	4	*20	*23	15
Dallas, Tex.	13	1	14	17	15
El Paso, Tex.	17	1	18	20	16
Fort Worth, Tex.	13	1	14	17	15
Houston, Tex.	15	1	16	19	15
San Antonio, Tex.	15	1	16	19	14

*Within city of Texarkana, Ark., the state tax on gasoline is 1c per gal. conforming with the Texas state tax. In Texarkana district outside of the city the 4c state tax applies.

V. M. & P. NAPHTHA

(Changes ordinarily occur coincident with gasoline price changes)

	Oleum Spirits	V.M.& P Naphtha	Cleaner Naphtha
Chicago	21	23	21
Detroit	22.2	24.7	22.7
Kansas City	21.2	23.2	21.2
Milwaukee	21.2	*25.7	*23.7
Minneapolis	*24.5	*27	*25
St. Louis	20.4	22.9	22.2
New York	...	22	....

*Includes 2c state tax.

CANADA

(Per Imperial Gallon, which is 1.2 American Gallons)

ONTARIO

	Gasoline T.W.	Tax	Total T.W.	S.S.	Oil T.W.
Toronto	24.5	3	27.5	31	24
Ottawa	24.5	3	27.5	31	24
Cochrane	28.5	3	31.5	40	29
Ft. William	24.5	3	27.5	32	26.5

MANITOBA

Winnipeg	27.5	3	30.5	34	26.5

SASKATCHEWAN

Regina	30.5	0	30.5	35	29.5

ALBERTA

Edmonton	29.5	2	31.5	35	28.5
Calgary	27.5	2	29.5	33	26.5

BRITISH COLUMBIA

Vancouver	21	3	24	28	23

QUEBEC

Montreal	24.5	3	27.5	31	24
Quebec City	26.5	3	29.5	33	26
Three Rivers	26.5	3	29.5	33	26

NEW BRUNSWICK

St. John	27.5	3	30.5	35	27
Moncton	27.5	3	30.5	35	27

NOVA SCOTIA

Halifax	27.5	3	30.5	35	27
Sydney	29.5	3	32.5	37	29

PRINCE EDWARD ISLAND

Charlottetown	27.5	3	30.5	34	27

Note: In districts surrounding these points 1c additional is added to city price.

Market Section

Slight Improvement Shown in Export Buying of Gasoline and Kerosene

By Special Correspondent
NEW YORK, Dec. 6

EXPORT demand for gasoline and kerosene improved slightly last week but was much lighter than expected. In the preceding week, and early last week, British and French buyers were actively inquiring for gasoline and kerosene, but only one confirmed sale was revealed. Gasoline was steady at the Gulf and the Atlantic Seaboard.

Kerosene was easier at New York but steady at the Gulf. Gas oil was weaker and foreign buyers are awaiting lower prices. Bunker oil was firmer. Paraffin waxes showed more life. Lubricants were also slightly more active.

Export Gasoline—New York

Export demand for gasoline lagged last week. Foreign inquiries were numerous but refiners reported Europeans reluctant to purchase at prevailing prices. Most foreign buyers believe prices are due to fall soon, and are holding off. However, all big Continental buyers are keeping in close touch with United States markets and are expected to buy heavily before Dec. 31. New York harbor refiners were asking 11½ cents a gallon for U. S. Motor gasoline, at refineries.

Cased gasoline was quiet. The only sale of consequence was 25,000 cases for December-January shipment to the Near East by an Independent refiner.

Export Gasoline—Gulf Ports

The only confirmed sale reported last week was a cargo of 56,000 barrels of 61-63, 390 end point gasoline to a London buyer for early December shipment. This deal was closed by a leading Independent refiner. The price is reported to have been 11¼ cents a gallon. This refiner is also working on an inquiry from France for 40,000 barrels of U. S. Motor and prime and water white kerosene for January shipment.

At the end of the week U. S. Motor was generally offered at 10½ cents; 60-62, 400 end point at 11 cents; 61-63, 390 end point at 11¼ cents and 64-66, 375 end point at 12 cents a gallon.

Cased gasoline demand lagged but prices were fairly well maintained and leading factors were demanding $2.05 for U. S. Motor and $2.30 for 64-66, 375 end point although it was rumored these prices could have been shaded 5 cents on a firm bid.

Domestic Gasoline—Gulf Ports

Most refiners reported a slump in demand from jobbers and prices were easier. U. S. Motor was freely offered at 10½ cents a gallon in tank cars at refineries. Weather has been less favorable.

Export Kerosene—New York

Export inquiries for kerosene have been numerous but refiners complain of a scarcity of orders. Most big European buyers have been buying hand-to-mouth for several weeks. However, now that the cold weather is here, European consumption is bound to soar and domestic refiners look for a large increase in the demand from the Continent.

New York harbor refiners last week cut their prices ¼-cent a gallon. Water white is available at 9¾ cents a gallon, bulk at refineries and prime white is 9½ cents. Cased kerosene was more or less neglected. A small Independent sold 25,000 cases of prime and water white kerosene for prompt shipment to the Near East. Prices were not divulged.

Export Kerosene—Gulf Ports

A large French buyer was negotiating for a cargo of 45,000 barrels of U. S. Motor gasoline and prime and water white kerosene for nearby shipment. It is expected that a leading refiner will book this order. Kerosene was steadier at the Gulf last week although no important price changes were reported. Prime white was generally quoted at 8 to 8⅛ cents a gallon and water white at 9¼ to 9½ cents. Cased kerosene was steady and in better demand. In cargo lots prime white was quoted at $1.75 and water white at $1.85 a case. A Chinese buyer is reported to have purchased 35,000 cases at these prices for January shipment.

Domestic Kerosene

New York harbor refiners reported a more active jobbing demand for kerosene which was held at 9½ cents for prime white and 9¾ cents for water white. In tank cars delivered water white was quoted at 10¾ cents and prime white at 10½ cents. Tank wagon prices were slightly steadier. The Gulf market for kerosene has not shown much change. Water white was quoted at 9½ cents, refinery, by leading factors.

Lubricants—New York

New York refiners reported a more active inquiry for neutral oils. French buyers have been credited with much of the recent buying. One of the smaller exporters reported sale of 1000 barrels of cylinder stocks. Prices are still easy. Pennsylvania 600 steam refined in barrels, New York, is offered freely at 18 cents a gallon.

Lubricants—Gulf Ports

Several leading refiners reported improvement in demand for zero cold test oils but most buying has been for domestic account. There was an inquiry from a German concern for 40,000 barrels of assorted lubricants but this is still hanging fire. Prices have shown little change. The general tendency, however, is now upward. A leading Independent refiner is negotiating for the sale of 20,000 barrels of assorted lubricants for January shipment to the Continent.

Wax Market—New York

Export buying interest in wax was keener last week although the volume of new buying orders placed remained small. Jobbers and refiners report stocks large but expressed the belief there would be a marked improvement in demand from abroad shortly as stocks there are reported to be small. Prices were steady. Domestic buying has been resumed along moderate lines.

Wax Market—Gulf Ports

Prices were a trifle softer. Export buying is still disappointing and in the main the situation has shown little or no change since last week. Spain and France are said to be inquiring for large quantities of fully refined and white crude scale waxes. South American candle makers are also showing more interest. On Saturday white crude scale 124-126 A.m.p. was quoted at 4½ cents a pound; 124-126 semi-refined at 4½ cents and fully refined grades were quoted as follows: 123-125 A.m.p., 5½ cents; 125-127, 5.55 cents; 128-130, 5⅝ cents; 133-135, 6½ cents, and 135-137, 6¾ cents.

Bunker Oil—New York

Export buying interest is keen but no bulk cargo sales of fuel oil were disclosed. Most foreign buyers, however, are following the New York market closely. Grade C bunker oil is firm at $1.75 a barrel at refineries and $1.81½ f.a.s. New York Harbor. Diesel oil is marking time at $2.50 a barrel at refineries. Movement in both oils was mainly against standing contracts.

Bunker Oil—Gulf Ports

Demand for grade C bunker oil for bunkering was more spirited but no cargo sales were disclosed. Most big buyers are keeping in close contact with the market, however. Grade C was generally quoted at $1.60 a barrel f.o.b. New

Orleans for bunkering and $1.45 for cargo oil. At Tampico grade C crude oil is steady at $1.45 a barrel in cargo lots including taxes. For bunkering the price was $1.55 a barrel f.o.b. Tampico including taxes. Heavy Panuco crude oil was nominally quoted at $1.25 a barrel taxes to be added.

Gas Oil—New York

New York harbor refiners reported little export buying interest in gas oil. Demand from abroad has been disappointing, and underlying conditions have not shown the expected improvement. For 36-40 in bulk, at the refineries the price is still quoted at 6¼ cents a gallon while 28-34 was freely offered at 5¾ cents a gallon same basis. Domestic buying has been mainly hand-to-mouth the last few weeks and stocks on hand are large.

Gas Oil—Gulf Ports

Undertone of the Gulf gas oil market remained easy last week. Most buying was confined to small quantities. It was persistently rumored a Continental buyer had purchased 40,000 barrels of dark gas oil at 4⅞ cents a gallon, but confirmation was withheld. Competition among the Gulf refiners has become keener as stocks on hand are large. Light 26-28 gravity is held at 5 to 5⅛ cents a gallon.

Boston Tank Wagon Market Is Still Unsettled

BOSTON, Dec. 6.—The gasoline tank wagon market in Boston where price cutting has been going on for the last few months, is still in an unsettled condition. The following letter, dated Dec. 4, was received today by National Petroleum News from a leading oil marketer in Boston:

"We believe the recognized tank wagon price in Boston today is 19 cents, although none of the large companies is getting this price or trying to get it from resale customers.

"We feel that most of the larger tank wagon buyers are paying 17 cents, and a few as low as 16 cents. All the Standard Oil owned stations are posting 21 cents retail, but the majority of their customers are selling at prices posted at 19 cents, and in some cases 18 cents. ..... This is, of course, also true of some of the other large companies. The Atlantic Refining Co. posts a price at their stations of 19 cents for cash.

"Conditions are very bad in metropolitan Boston and there are retail prices as low as 15 cents. One of the large Independent companies with a chain of 80 to 100 stations, posts 21 cents and sells at 19 cents or less."

SAN ANGELO, TEX.—The low price of cotton is expected to reduce the sales of automobile supplies within the next few months, according to reports of oil men in this section.

Complete Export Markets

New York Export Market

GASOLINE	Dec. 6	Nov. 29
U. S. Motor Tank cars Ref.	11½	11½–11¾
U. S. Motor cases	27.40	–27.15
California grade U. S. Motor F. O. B. N. Y. Cargoes	11¼	–11¼
KEROSENE		
43-43-150W.W.Tank cars Ref.	09¾	–10
43-45-150W.W.Cases	19.65	–19.65
42-44-110S.W.Cases	19.15	–19.15
GAS OIL		
36-40, Bulk Refinery	–06¼	–06¼
28-34, Bulk Refinery	–05¾	–05¾
MEXICAN BUNKER OIL		
Grade C. f. o. b. ref. Bulk	–1.75	–1.75
Diesel Oil f. o. b. ref. Bulk	–2.50	–2.50

LUBRICATING OILS

The following prices are cooperage basis f. o. b. New York, products being manufactured by inland refineries.

CYLINDER OILS (Bbls.)

1 inch Immersion Test; All Penna. Products

Filtered D 600	27	–27
Filtered E 600	26	–26
Unfiltered 600 s. r.	18	–18
Unfiltered 650 s. r.	23½	–23½
600 Fash s. r.	25	–25
630 Flash	34	–34

RED PARAFFIN (Bbls.)

(Viscosity at 70)

300 vis. No. 5 color	21	–21
250 vis. No. 5 color	20	–20
High Viscosity. No. 5 color	25	–25

NEUTRAL OILS (Bbls.)

(Viscosity at 70)

200 vis. at F. Pale. No. 3 color	–31	–31
180 Pale. No. 3 color	–29	–29
150 Pale. No. 3 color	–24½	–24½

BLACK OIL (Bbls.)

25-30 cold test	13¾	–13¾
15 cold test	14½	–14½

MEDICINAL OILS

(Includes Price of Drums)
(Penna. Stocks)

	Dec. 6	Nov. 29
Domestic 875-885 s. g.	– .85	– .85
Domestic 865-.870 s. g.	.75– .80	.75– .80
Russian 885-.890 s. g. 325-330 vis.	1.00–1.10	1.00–1.10

WAXES

(Penna. Stocks)
(In Cents per Pound, F. A. S. Carload Lots)

WHITE CRUDE SCALE (Shipped in Bbls.)

122-124 A. m. p.	–04⅞	–4.90
124-126 A. m. p.	–04⅞	–05

MATCH

105-108 A. m. p.	–05⅝	–05¾

FULLY REFINED (Shipped in Canvas Bags)

120-122 A. m. p.	–05¾	–05¾
123-125 A. m. p. Philadelphia.	–05¾	–05¾
125-127 A. m. p.	–05¾	–05¾
128-130 A. m. p.	–05⅞	–05⅞
130-132 A. m. p.	–06⅛	–06⅛
133-135 A. m. p.	–06½	–06½
135-137 A. m. p.	–06¾	–06¾

YELLOW CRUDE SCALE

124-126 A. m. p.	–04¾	–4.90

PETROLATUMS

(Penna. Stocks)
Per Pound

Dark Green	02½	02½
Veterinary	03	03
Light Amber	03¼	03¼
Dark Amber	03½	03½
Cream	06½	06½
Lily White	08½	08½
Snow White	09¼	09¼

Gulf Export Market

GASOLINE
F. O. B. Seaboard
(Shipments of 20,000 Bbls. and over)

	Dec. 6	Nov. 29
U. S. Motor, Bulk	–10½	–.10½
60-62 400 e. p. Bulk	–11	–.11¼
61-63 390 e. p. Bulk	–11¼	–.11½
64-66 375 e. p. Bulk	–12	–.12
U. S. Motor, Cases (cargo lots.	2.05	2.05
64-66 Cases (cargo lots)	2.25	2.25
KEROSENE		
Water White, 43-45 bulk	09½	–09½
Prime White, 41-43 Bulk	08	–08
Water White, cases (cargo lots)	1.85	1.85
Prime White, cases (cargo lots)	1.75	1.75
DOMESTIC GAS AND BUNKER OIL		
26-28, gravity, Bulk*	05	–05
32 plus, bulk, Dark	04¾	–04⅞
Grade C, Bunker oil	1.60	–1.60
Cargoes	1.45	–1.45

*Translucent through neck of a 4 oz. bottle.

MEXICAN CRUDE AND BUNKER OILS
F. O. B. Steamer Tampico

Heavy, Panuco crude Taxes to be added	1.25	–1.25
Grade C, Bunker oil Taxes paid cargoes	nominal	nominal
Grade C, Bunker oil, F. O. B. Tampico, For Bunkering Purposes, taxes paid	1.55	–1.55

SOUTH TEXAS
(Viscosity at 100° F; cold test 0)
(Tanker, F. O. B. Houston)

*LUBRICATING OILS	Dec. 6	Nov. 29
100 Vis. No. 2 Unfiltered Pale.	08¼	08¼
150 Vis. No. 2½ Unfiltered Pale	10¼	10¼
200 Vis. No. 3 Unfiltered Pale.	11	11
300 Vis. No. 3 Unfiltered Pale.	12½	12½
500 Vis. No. 3½ Unfiltered Pale	14	14
200 Vis. No. 5½ Red Oil	10¼	10¼
300 Vis. No. 5½ Red Oil	10¾	10¾
500 Vis. No. 6 Red Oil	11½	11½
800 Vis. No. 6 Red Oil	16	16

*These prices are entirely nominal owing to wide fluctuations.

Pacific Export Market

(Cargo lots quotations at seaboard, Los Angles Gravity test on A. P. I. scale)

	Dec. 6	Nov. 29
Gasoline, U. S. Motor— 54°-56°	8½– 9	08½– 9
Gasoline, U. S. Motor— blends and special cuts	9¾–10	9¾–10
Gas Oil, 30°—34° per bbl.	$1.30–1.35	1.30–1.35
Diesel Oil, 27°—plus per bbl.	$1.00–1.15	1.00–1.15
Bunker Oil, 14°—18° bbls.	$ .80–1.00	.80–1.00
Fuel Oil, 14°—18° per bbl.	$ .80–1.00	.80–1.00
Kerosene, W. W. 38°—40° per gal., 125-150 flash test	05½–06	.05½– .06
Cased Goods		
Gasoline, U. S. Motor	$2.25	–2.25
Kerosene, W. W. 38°—40° per case, 125-150 flash	$1.45–1.55	$1.45–1.55

N. Y. Domestic Market

The following light oil, gas and fuel oil prices are F. O. B. New York refineries, being products made from Domestic (including California) and Mexican Crudes.

	Dec. 6	Nov. 29
U. S. Motor Gasoline, Tank Cars Delivered greater N.Y.	–12½	–12½
U. S. Motor Gasoline, Tank Cars Bayonne	–11½	–11½
U. S. Motor Tank Cars, *Atlantic Seaboard Terminals.	–11½	–11½
Kerosene, 44 150 W. W. Tank Cars de'd greater N.Y.	–10¾	–11
Grade C Bunker f.o.b. N.Y. Ref	–1.75	–1.75
Diesel Oil f.o.b. Refinery	2.50	2.50
Gas Oil, 36-40, Bulk Refinery..	–06¼	–06¼
Gas Oil, 28-34, Bulk Refinery..	–05¾	–05¾

*New York, Philadelphia, Portsmouth, Va., Charleston, S. C.

Crude Oil Prices, as Posted by Major

EASTERN FIELDS

(Posted by Joseph Seep Purchasing Agency)

Penna. Grade Oil in New York Transit Lines (Alleghany, N. Y. District)	$3.15
Bradford District Oil in National Transit Lines (Bradford District)	3.15
Penna. Grade Oil in National Transit Lines (Other Pennsylvania)	3.05
Penna. Grade Oil in Southwest Penna. Pipe Lines (Other Pennsylvania)	3.05
Penna. Grade Oil in Eureka Pipe Lines (West Virginia)	3.00
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O. district)	2.80
Keister Grade in National Transit Lines (Butler Co.)	1.80
Cabell Grade in Eureka Pipe Lines (West Virginia)	2.10
Corning Grade in Buckeye Pipe Lines (Ohio)	2.25
Corning, O. heavy grade	2.15
*Somerset Medium in Cumberland Pipe Lines (Kentucky)	2.20
*Somerset Light in Cumberland Pipe Lines (Kentucky)	2.35
Ragland Grade in Cumberland Pipe Lines (Kentucky)	.95

*Somerset oil run prior to Oct. 1, 1923, takes price of 6 cents lower than above quotations.

(Posted by Stoll Oil Refining Co.)

Oil City Ky. oil in Stoll lines	$2.35

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.

Wooster	$2.25	Plymouth	$1.63
Lima	2.21	WesternKentucky	1.83
Waterloo	1.85	*Canadian Petrolia	2.61
Indiana	1.98	*Oil Springs	2.68
Princeton	2.10	*Posted by Imperial Oil Ltd.	
Illinois	2.10		

OKLAHOMA, KANSAS And NORTH TEXAS

Prices of Prairie Oil & Gas Co.
(In Oklahoma, Kansas, North and East Central Texas)

Effective Nov 17, 1926.

28-28.9	$1.50	34-34.9	$1.80
29-29.9	1.55	35-35.9	1.85
30-30.9	1.60	36-36.9	1.90
31-31.9	1.65	37-37.9	1.95
32-32.9	1.70	38-38.9	2.00
33-33.9	1.75	39-39.9	2.05
40-40.9	$2.10	47-47.9	$2.45
41-41.9	2.15	48-48.9	2.50
42-42.9	2.20	49-49.9	2.55
43-43.9	2.25	50-50.9	2.60
44-44.9	2.30	51-51.9	2.65
45-45.9	2.35	52 and above	2.70
46-46.9	2.40		

Above schedule met by Sinclair and Gulf on Nov. 17.

Humble Oil & Refining Co. Prices
(Ranger, North Texas, Mexia, Powell, Richland, Wortham, Lytton Springs, Currie, Moran and Nocona crudes all in Texas.)

On Nov. 1, Humble first posted the price schedule adopted by Prairie on Nov. 17, except that Humble is paying 5c less for each degree of gravity on oil below 28°.

Mirando, Tex	$1.25

The Texas Co. posted same gravity and price schedule in Oklahoma, North, North Central and Central Texas on Nov. 5 as Humble, excepting it is paying $1.40 for all oil below 28° gravity in Texas fields.

Magnolia Petroleum Co.
(In Oklahoma, Kansas and North and East Central Texas)

Same grades and prices as posted by Prairie excepting that Magnolia is paying $1.30 for all oil below 28° gravity, effective Nov. 2.

Corsicana heavy	$1.25
Iatan Tex	1.50

Carter Oil Co.
(Oklahoma and Kansas)

On Nov. 2, Carter posted same gravity and price schedule as Prairie is now maintaining.

PANHANDLE, TEXAS

Humble Oil & Refining Co.

Hutchinson, and Carson Counties $1.25

Gray County:		Wheeler County:	
28-28.9	$1.00	28-28.9	$ .90
29-29.9	1.05	29-29.9	.95
30-30.9	1.10	30-30.9	1.00
31-31.9	1.15	31-31.9	1.05
32-32.9	1.20	32-32.9	1.10
33-33.9	1.25	33-33.9	1.15
34-34.9	1.30	34-34.9	1.20
35-35.9	1.35	35-35.9	1.25
36-36.9	1.40	36-36.9	1.30
37-37.9	1.45	37-37.9	1.35
38-38.9	1.50	38-38.9	1.40
39-39.9	1.55	39-39.9	1.45
40-40.9	1.60	40-40.9	1.50
41-41.9	1.65	41-41.9	1.55
42-42.9	1.70	42-42.9	1.60
43-43.9	1.75	43-43.9	1.65
44 and above	1.80	44 and above	1.70

Magnolia Petroleum Co. posted flat price of $1.25 for all Panhandle Crude on Sept. 22, and Kay County Gas Co. on Oct. 4.

WEST TEXAS

(Crane, Upton and Crockett Counties)
Humble Oil & Refg. and Kay County Gas Co.

Below 26	$ .80	31-31.9	$1.10
26-26.9	.85	32-32.9	1.15
27-27.9	.90	33-33.9	1.20
28-28.9	.95	34-34.9	1.25
29-29.9	1.00	35-35.9	1.30
30-30.9	1.05	36 and above	1.35

NORTH LOUISIANA—ARKANSAS FIELDS

***Prices of Standard Oil Co. of Louisiana**

Caddo, Homer, Haynesville, Bull Bayou, El Dorado, Crichton and De Soto
Effective Nov. 4

Below 28	$1.40	40-40.9	$2.10
28-28.9	1.50	41-41.9	2.15
29-29.9	1.55	42-42.9	2.20
30-30.9	1.60	43-43.9	2.25
31-31.9	1.65	44-44.9	2.30
32-32.9	1.70	45-45.9	2.35
33-33.9	1.75	46-46.9	2.40
34-34.9	1.80	47-47.9	2.45
35-35.9	1.85	48-48.9	2.50
36-36.9	1.90	49-49.9	2.55
37-37.9	1.95	50-50.9	2.60
38-38.9	2.00	51-51.9	2.65
39-39.9	2.05	52 and above	2.70
Smackover, below 24			$1.10
" 24-24.9			1.35
" 25-25.9			1.40
" 26-26.9			1.45
" 27 and above			1.50
Bellevue			1.40
Cotton Valley			1.20
**Urania, La			1.10
†Calion (East El Dorado)			.95

*Gulf and La. Oil Refg. Corp. met S. O. La. prices on Nov. 4 and The Texas Co. and Magnolia Pet. met on Nov. 5.

**Posted by Louisiana Oil Refining Corp.

†Posted by Gulf.

STEPHENS, ARKANSAS

Posted by Atlantic Oil Producing Co.

Below 28	$1.30	29-29.9	$1.45
28-28.9	1.40	30 and above	1.50

GULF COASTAL and SPINDLETOP

Posted by Humble Oil & Refining Co.

Grades A	$1.40	28-29.9	$1.65
Grades B:		30-30.9	1.70
Below 25	1.40	31-31.9	1.75
25-25.9	1.45	32-32.9	1.80
26-26.9	1.50	33-33.9	1.85
27-27.9	1.55	34-34.9	1.90
28-28.9	1.60	35 and above	1.95

Fields classified as A and B are Goose Creek, Hull, Liberty, West Columbia, Orange, Boling and Pierce Junction. All other fields are Grades A only.

Magnolia Petroleum is paying same prices in Spindletop as Humble, except that its top grade is 31-31.9 at $1.75, effective Nov. 16.

California Fuel Market Soggy Crude Cut Expected

Staff Special

LOS ANGELES, Dec. 4

PETROLEUM marketing circles were quiet this week, with fuel oil easier, if any change, although quotations stand around 80 cents a barrel for both fuel and bunkers f.o.b. harbor. Standard Oil Co. of California continues officially quoting fuel oil and bunkers at $1, but no one seems to be getting such a price.

Late this week, two tankers were offered for charter, $1.10 being asked for clean bottom and the dirty boat asking 5c more. It is unusual for a dirty bottom to demand a higher charter rate than a clean, but that was the offer.

At this rate, it costs approximately 2⅝ cents a gallon to move gasoline from Los Angeles or San Francisco to points on the east coast. Naturally a company owning its own tankers can move this product for considerably less. Gasoline, U. S. Motor, can be purchased in spot cargoes in Los Angeles at prices ranging from 8½ to 9 cents. Some refiners claim they are able to get better prices than are quoted here, but others are willing to sell at the prices named. It is true that the low price is about rock bottom, and shipping about would not lower the price. Tank car loads are quoted around 1 cent higher than cargoes.

Fuel oil is moving, but not in desired quantities. The large production of low gravity crudes, with little if any gasoline content, in the state is having a depressing effect, especially in the face of the high charter rate for tankers.

Many have expected Standard of California to announce a cut in the posted price of crude, but so far none has been made. The cut has been freely predicted for two weeks but after this delay, some predict its postponement until after the first of the year. A cut in the price of California crude now would force reductions in values in the large companies' stocks, to show up in the balance sheets at the end of the year. It is thought possible this feature has something to do with the delay.

Production of crude oil in California continues to mount and there is no hope for a decline for some time.

There has been no change in the kerosene market, and movement is slow. Only a few of the larger refiners pay attention to this product, and if a buyer comes into the market, he shops around and buys where he can get the best price.

There is an increase in the production of natural gasoline in California and further increases are expected as more wells are completed at Huntington Beach, Seal Beach and Ventura Avenue. The gas at Huntington Beach

(Continued on page 127)

Purchasers, in All Fields (in Effect, Dec. 6, 1926)

GULF COASTAL and SPINDLETOP
Prices of The Texas Co.

Grades A	$1.40	*Grades B	$1.40
‡Grades B (light crude):			
35-35.9	$1.95	38-38.9	$2.10
36-36.9	2.00	39-39.9	2.15
37-37.9	2.05	40 and above	2.20

*Grades B include all heavy crudes which do not meet tests for Grades A or for Gulf Coast light crude.

‡The Texas Co.'s gravity and price schedule on oil below 35° is same as Humble's postings on Grades B.

ROCKY MOUNTAIN FIELDS
Prices of Ohio Oil Co. and Midwest Refining Co

‡Salt Creek	29-29.9	$1.55
" "	30-30.9	1.60
" "	31-31.9	1.65
" "	32-32.9	1.70
" "	33-33.9	1.75
" "	34-34.9	1.80
" "	35-35.9	1.85
" "	36-36.9	1.90
" "	37 and above	1.95
Elk Basin		2.00
Grass Creek light		2.00
Big Muddy		$1.85
Lance Creek		2.00
Rock Creek		1.85
Mule Creek		1.45
Rex Lake		1.25
‡Osage		2.00
‡Cat Creek, Mont.		2.00
Sunburst, Mont.		1.35
‡Hogback, N. Mex.		2.45
Artesia, N. Mex.		1.65

‡Posted by Midwest Refining Co. Midwest also buys Grass Creek light, and Elk Basin.

The Texas Co. buys Salt Creek and Big Muddy crude.

CALIFORNIA
Standard Oil Co. of California

Gravity	Signal Hill Huntington Beach	Ingle-wood Torrance	Whittier La Habra	Newhall, McKittrick, Kern River	Olinda-Brea Canon, Richfield	Athens-Rosecrans Dominguez	Monte-bello	Coyote Hills	Santa Fe Springs	Midway Sunset Elk Hills
14-14.9	$ .85	$ .85	$ .85	$ .75	$ .85	.....	$ .85	$ .85	.....	$ .75
15-15.9	.87	.87	.85	.75	.87	.....	.85	.85	.....	.75
16-16.9	.90	.90	.85	.75	.90	.....	.85	.85	.....	.75
17-17.9	.94	.94	.85	.75	.94	.....	.85	.85	.....	.75
18-18.9	.98	.98	.86	.75	.98	.....	.86	.86	.....	.75
19-19.9	1.04	1.04	.87	.75	1.04	.....	.87	.87	.....	.75
20-20.9	1.10	1.10	.89	.....	1.10	.....	.89	.90	.....	.82
21-21.9	1.16	1.16	.91	.....	1.16	.....	.91	.98	.....	.90
22-22.9	1.22	1.22	.94	.....	1.22	.....	.94	1.06	.....	1.00
23-23.9	1.28	1.28	.....	.....	1.28	.....	.97	1.14	.....	1.11
24-24.9	1.34	1.34	.....	.....	1.34	$1.34	1.01	1.22	$1.02	1.22
25-25.9	1.40	1.40	.....	.....	1.40	1.40	1.05	1.30	1.08	1.33
26-26.9	1.46	1.46	.....	.....	1.46	1.46	1.09	1.38	1.16	1.44
27-27.9	1.52	1.52	.....	.....	1.52	1.52	1.13	1.46	1.24	1.55
28-28.9	1.58	1.58	.....	.....	1.58	1.58	1.17	1.54	1.32	1.66
29-29.9	1.64	.....	.....	1.64	1.64	1.64	1.21	1.62	1.40	1.77
30-30.9	1.70	.....	.....	.....	1.70	1.70	1.25	1.70	1.48	1.88
31-31.9	1.76	.....	.....	.....	.....	1.76	.....	.....	1.60	1.99
32-32.9	1.84	.....	.....	.....	.....	1.84	.....	.....	1.72	2.10
33-33.9	.....	.....	.....	.....	.....	1.92	.....	.....	1.84	2.21
34-34.9	.....	.....	.....	.....	.....	2.00	.....	.....	1.96	.....
35-35.9	.....	.....	.....	.....	.....	2.08	.....	.....	2.08	.....
36-36.9	.....	.....	.....	.....	.....	2.16	.....	.....	2.16	.....
37-37.9	.....	.....	.....	.....	.....	2.24	.....	.....	2.24	.....
38-38.9	.....	.....	.....	.....	.....	2.34	.....	.....	2.34	.....
39-39.9	.....	.....	.....	.....	.....	2.44	.....	.....	2.44	.....
40-40.9	.....	.....	.....	.....	.....	2.54	.....	.....	.....	.....
41-41.9	.....	.....	.....	.....	.....	2.64	.....	.....	.....	.....
42-42.9	.....	.....	.....	.....	.....	2.74	.....	.....	.....	.....

Santa Maria and Ventura Posted by Union Oil Co.

Gravity	Lost Hills	Coalinga	Wheeler Ridge	Santa Maria	Ventura
14-14.9	$ .75	$ .75	$ .75	$ .85	$ .85
15-15.9	.75	.75	.75	.85	.85
16-16.9	.75	.75	.75	.85	.85
17-17.9	.75	.75	.75	.85	.85
18-18.9	.75	.75	.75	.85	.85
19-19.9	.75	.75	.75	.85	.85
20-20.9	.82	.79	.78	.90	.90
21-21.9	.90	.86	.81	.97	.97
22-22.9	1.00	.93	.85	1.04	1.04
23-23.9	1.11	1.00	.89	1.11	1.11
24-24.9	1.22	1.07	.93	1.18	1.18
25-25.9	1.33	1.14	.97	1.25	1.25
26-26.9	1.44	1.21	1.01	1.32	1.32
27-27.9	1.55	1.28	1.05	1.39	1.39
28-28.9	1.66	1.35	.....	1.46	1.46
29-29.9	1.77	1.42	.....	1.53	1.53
30-30.9	1.88	1.49	.....	1.60	1.60
31-31.9	1.99	1.56	.....	.....	1.67
32-32.9	2.10	1.63	.....	.....	1.73
33-33.9	2.21	1.70	.....	.....	1.79
34-34.9	2.32	1.77	.....	.....	1.85
35-35.9	.....	1.84	.....	.....	1.92
36-36.9	.....	.....	.....	.....	.....
37-37.9	.....	.....	.....	.....	.....
38-38.9	.....	.....	.....	.....	.....
39-39.9	.....	.....	.....	.....	.....
40-40.9	.....	.....	.....	.....	.....
41-41.9	.....	.....	.....	.....	.....
42-42.9	.....	.....	.....	.....	.....

*Union Oil Co. also purchases Long Beach Crude and is maintaining the same gravity and price schedule in that field as the Standard maintains in Signal Hill and Huntington Beach fields. The Union also buys and pays the same prices as the Standard in the Rosecrans-Dominguez fields, on gravities ranging from 14 degrees to and including 24.9 degrees and in Santa Fe Springs, on gravities ranging from 20 to and including 23.9 degrees.

REFINERS' and COMPOUNDERS' SUPPLIES

Following are the average market prices for the week on materials used by refiners and compounders f. o. b. shipping point as effective this date.

Refiners' Supplies

	Dec. 6	Nov. 29
Soda Ash light 58⅓ bags.cwt.	$1.38	$1.38
Silicate of Soda 60 deg. drums.....cwt.	-$1.65	-$1.65
Sal Soda wks.....90-	1.10	.90- 1.10
Caustic Soda 70¼ solid..cwt.	- 3.05	3.05-3.10
Chloride of Lime.....cwt. works.....	- 2.00	- 2.00
Sulphuric Acid 60 deg. tank cars f. o. b. shipping point.....per ton	10.50-11.00	10.50-11.00
Liquid Chlorine tank cars works.....lb.	- .04	- .04

Compounders' Supplies (Open Market)

Vegetable Oils—

Linseed carloads spot.....lb.	10.6	11
December.....	10.6	11
Tanks, spot.....	10	10.2
*Soya Bean spot, Bbls....lb.	12½	13

Castor Oil—

No. 1 Carlots, Bbls.....	-.12¼	-.12¼
No. 3 Carlots, Bbls.....	-.11¾	-.11¾

Animal Oils—

English Degras.....	.05½	-.05½
Domestic Degras, bbls., carloads.....lb.	-.04¾	-.04¾
*Horse.....lb.	-.08¼	-.08¼

Oleic Acid—

Dist. Bbls.....lb.	.09½-.10	.09¾-.10¼
Saponified Bbls.....lb.	.09¾-.10¼	.10¼-.10½

Lard Oils—

Prime		
Winter Strained. to	1⅓ ffa.40/45c.t.lb.	.14½ .14½
Extra Winter Strained. 2 to	4½ ffa.40-45c.t.lb.	.12¾ .12¾
Extra..... 4 to	5 ffa.40-45c.t.lb.	.12¼ .12¼
Extra No.1. 7 to	10 ffa.40-50c.t.lb.	.10¼ .10¼
No. 1.....15 to	18 ffa.40-45c.t.lb.	.10 .10
No. 2.....22 to	23 ffa.40-45c.t.lb.	.09¾ .09¾
Prime Edible Tallow under	1⅓ ffa.	
40-45c.t.N.Y.....lb.	-.08¼	-.08¾
Tallow acidless.....lb.	-.10¾	-.10¾
Lard Stearine.....lb.	-.16½	-.16¾
Oleo Stearine.....lb.	-.09¾	-.10¼

Neatsfoot Oil—

Pure.....bbls.-lb.	.13¾	.13¾
Extra.....do lb.	.10¼	.10¼
No. 1.....bbls.-lb.	.10	.10
Cold pressed.....lb.	.17¾	.17¾

Fish Oils—

Menhaden Oil		
Light pressed.....gal.	-.58	-.58
White.....gal.	-.67	-.67
Yellow bleached.....gal.	-.65	-.65
*Herring tank cars coast.....gal.	-.47	-.47
Whale, extra winter bleached.....gal.	-.82	-.82
Seal.....gal.		nominal

Naval Stores—

Turpentine, N. Y.....gal.	-.88	-.89
Turpentine†.....gal.	-.82	-.82½
Rosin, B. N. Y.....bbl.	12.60	13.00
Rosin, F. N. Y.....bbl.	12.60	13.15
Rosin, B†.....bbl.	11.05	11.25
Rosin, F†.....bbl.	11.05	11.35
Rosin Oil 1st run.....gal.	.79	.82
Rosin Oil 2nd run.....gal.	.90	.90

Pine Tar—

Kiln Burnt.....bbl.	16.00	16.00
Retrt.....bbl.	16.00	16.00

†Savannah, Ga. market.
*Nominal.

Alcohol—Denatured—
Formula 5

Bbls.....gal.	-40	-40
Drums.....gal.	-38	-38

OIL STOCKS AND FINANCES

National Petroleum News

Shell Union and Barnsdall Report Larger Profits

CLEVELAND, Dec. 4.

SHELL Union Oil Corp. and Barnsdall Oil Corp. report much larger earnings in the third quarter of 1926 than in the third quarter of 1925 and also for the nine months ended Sept. 30 as compared with the corresponding nine months of 1925. These two companies make the best showing revealed in recently issued earnings accounts.

California Petroleum Corp.'s third quarter was slightly under its 1925 third quarter but net profit per share of common was higher in the first three quarters of this year than in the corresponding time last year.

Simms Petroleum Co. and Panhandle Producing & Refining Co. earnings are running lower this year than a year ago. Superior Oil Corp. for the third quarter reports net income of $64,939 after depreciation and depletion but the loss on the first nine months' operations amounted to $310,821, a reduction of $100,000 from the 1925 rate of loss.

Condensed Comparative Earnings Statements for Third Quarters of 1925 and 1926

Company		Gross Operating Income	Expenses Taxes, etc.	Net Operating Income	Total Income	Depreciation, Depletion, Drilling Res.	Interest, U.S.Taxes etc.	Net Profits	Net on Common a Share
Simms Petroleum Co	1926	$ 2,253,281	$ 877,672	$ 1,375,609	$ 1,442,532	$ 1,050,665	$ 85,444	*$ 306,423	*$0.44
do	1925	2,158,353	731,468	1,426,885	1,498,113	924,023	73,965	500,125	0.73
Panhandle Prod. & Refg. Co	1926	1,353,185	1,141,995	211,190	235,973	161,011	63,025	11,937	0.05
do	1925	1,364,843	1,325,696	39,147	39,395	.....	16,549	22,846	....
California Petroleum Corp	1926	8,978,732	4,727,238	4,251,494	4,251,494	2,078,760	336,866	1,835,868	0.96
do	1925	5,953,891	2,052,829	3,901,062	3,901,062	1,622,506	322,816	1,955,740	1.02
Shell Union Oil Corp	1926	20,788,285	.....	.....	.....	6,835,225	.....	*18,953,060	....
do	1925	15,045,095	.....	.....	.....	6,894,240	.....	* 8,150,855	....
Superior Oil Corp	1926	523,185	200,299	.....	.....	257,947	.....	64,939	....
do	1925	285,712	208,433	.....	.....	245,288	.....	† 168,009	....
Barnsdall Corp	1926	8,006,256	5,033,433	2,972,823	2,978,831	875,322	489,925	1,613,584	1.41
do	1925	3,872,733	2,432,712	1,440,021	1,452,319	353,914	165,503	932,900	1.02

*Before Federal taxes. †Deficit or loss.

Condensed Comparative Earnings Statements for First Three Quarters of 1925 and 1926

Company		Gross Operating Income	Expenses, Taxes, etc.	Net Operating Income	Total Income	Depreciation, Depletion Drilling Res.	Interest, U.S.Taxes etc.	Net Profits	Net on Common a Share
Simms Petroleum Co	1926	$ 5,994,683	$ 2,447,157	$ 3,547,526	$ 3,680,668	$ 2,791,167	*$ 235,736	$ 653,765	$0.95
do	1925	6,801,207	1,827,697	4,973,510	5,192,552	2,562,579	322,213	2,307,760	3.38
Panhandle Prod. & Refg. Co	1926	3,658,189	3,231,005	427,184	524,865	372,258	107,052	45,555	....
do	1925	3,962,877	3,647,418	315,459	323,998	.....	56,744	267,254	....
California Petroleum Corp	1926	24,575,360	12,026,938	12,548,422	12,548,422	6,145,284	989,204	5,413,934	2.84
do	1925	16,767,422	5,932,838	10,834,584	10,834,584	4,768,179	923,430	5,142,975	2.70
Shell Union Oil Corp	1926	51,403,254	.....	.....	.....	20,209,817	.....	*31,193,437	....
do	1925	38,963,366	.....	.....	.....	19,257,503	.....	*19,705,863	....
Superior Oil Corp	1926	1,070,336	709,336	.....	.....	671,543	.....	† 310,821	....
do	1925	1,023,667	671,844	.....	.....	763,773	.....	† 411,950	....
Barnsdall Corp	1926	23,044,467	14,211,019	8,833,448	8,886,345	2,572,281	1,546,762	4,767,401	4.19
do	1925	10,902,502	7,193,043	3,709,459	3,739,060	1,022,836	557,225	2,158,996	2.37

*Before Federal taxes. †Deficit or loss.

New York Standard Sells $50,000,000 Notes

NEW YORK, Dec. 4.—The second large offering of Standard Oil securities recently was made this week by Dillon, Read & Co. who bought and put on the market $50,000,000 25-year 4½ per cent debentures of the Standard Oil Co. of New York. The price was 97¾ to yield 4.67 per cent. The purpose of the issue was stated to be for general corporate uses. With the Dillon firm is associated the Guaranty Co. of New York and the Union Trust Co. of Pittsburgh.

It is understood that the money will be used in part in the acquisition of the minority interest in the Magnolia Petroleum Co. and to develop properties of the General Petroleum Corp. in California.

The Standard of New York has outstanding 16,760,931 shares of stock with a market value of $530,000,000. Application has been made to list the stock on the New York Stock Exchange.

Pan American Lists Lago Exchange Shares

NEW YORK, Dec. 4.—New York Stock Exchange has listed 666,628 additional shares of Pan American Petroleum & Transport Co. class B common stock, par value $50 a share. This stock is being used to exchange for minority stock in the Lago Oil & Transport Co. on a basis of one share of Pan American for three of Lago. Pan American controls Lago but wishes complete ownership.

In connection with the listing application Pan American filed the following balance sheet as of June 30:

ASSETS

Real estate, plant and equipment after deprec.	$112,442,773
Cash with trustees	728,326
Investments in affil. cos.	27,217,450
Oil inventories	15,598,938
Materials and supplies	7,132,184
Accounts receivable	10,989,357
Marketable securities	5,666,315
Cash	12,822,747
Oil due from U. S.	598,879
Deposit with Mexico	1,500,000
Deferred charges	2,130,892
Total	$196,827,861

LIABILITIES

Common stock	$ 50,077,950
Class B common	87,989,400
Stock of controlled cos	1,345,387
Bonded and mortgaged debt	15,761,000
Accounts payable	6,115,376
Notes payable	257,300
Accrued dividends	4,169,771
Taxes and contingencies	7,273,212
Surplus	23,837,565
Total	$196,827,861

Transactions In Oil Shares on New York Stock Exchange

1925 High	1925 Low	1926 High	1926 Low		Listed Capital	Par Value	Stocks	Div. Rate	Last Paid	Transactions week ended Dec. 4 Sales	First	High	Low	Last	Ch'ge
.....	.....	32⅞	24¼	(sh)	713,000	N.P.	Amerada Corp.	50cQ	Oct. 30, 26	6,500	29¼	30	29¼	29⅝	+ ⅛
79¾	48	74	39⅞	(sh)	200,000	N.P.	American Republics	.....	.....	.....	.....	.....	.....	.....	.....
47¼	32	59½	44¾	$	56,000,000	$ 25	Associated Oil	50cQ	Sept. 25, 26	100	50½	50½	50½	56½	0
117½	95½	128¾	97		50,000,000	100	Atlantic Refining	.....	June 16, 24	25,000	103	113	103	110	+7⅛
117¾	113½	120	115⅛		20,000,000	100	do pfd	$1¾Q	Nov. 1, 26	600	116¾	116¾	116½	116½	0
38½	18¾	33½	23¾		25,000,000	25	Barnsdall Corp. A	50cQ	Oct. 1, 26	38,200	26¾	28¾	26¾	28	+1
30	16	29½	22½		3,713,275	25	do B	50cQ	Oct. 1, 26	3,100	24⅞	26¼	24⅞	26	+1
34⅜	23⅞	38⅛	29¾	$	45,040,125	$ 25	California Petroleum	50cQ	Dec. 1, 26	17,000	30⅝	31¾	30⅝	31¼	+ ⅝
70	42½	94½	50		23,542,500	100	General Asphalt	.....	.....	89,300	83⅞	89⅛	83⅞	85⅞	+1¾
109	86½	140⅛	94⅞		7,416,000	100	do pfd	$1¼Q	Dec. 1, 26	1,400	127	133	127	133	+5⅛
85	59	72	50¼		25,000,000	100	Houston Oil	.....	.....	7,500	55⅜	59¾	55⅜	59¾	+4¾
41¾	13½	34	19⅝	(sh)	500,000	N.P.	Independent Oil & Gas	25cQ	Oct. 18, 26	47,300	27½	30	26½	30	+3
14¼	5½	13¾	7¾	$	3,204,590	$ 10	Indian Refining	.....	Dec. 15, 20	1,200	7¾	8⅝	7¾	8⅝	+ ¼
12⅝	6	12½	7½		4,545,860	10	do ctfs	.....	.....	1,200	8	8	8	8	0
110	77	104	90		2,296,400	100	do pfd	.....	Dec. 15, 21	100	96	96	96	96	0
1½	¼	¾	⅛		1,678,760	10	Kansas & Gulf	.....	.....	1,900	¼	¼	¼	¼	0
.....	.....	24½	19⅛	(sh)	4,000,000	N.P.	Lago Oil & Transport	.....	.....	19,000	20⅛	21⅜	20⅛	21⅛	+1
23¾	13⅝	19⅞	12	(sh)	1,131,216	N.P.	Louisiana Oil Refining	.....	.....	13,900	14¼	15⅛	14⅝	15	+ ½
.....	.....	97	93½	$	4,000,000	$100	do pfd	$1⅝Q	Nov. 15, 26	.....	.....	.....	.....	.....	.....
35½	20¾	28⅞	16½	(sh)	330,000	N.P.	Maracaibo Oil	.....	.....	6,500	18½	21⅝	18	21	+1¾
60½	32⅝	63⅜	49¼	(sh)	1,895,823	N.P.	Marland Oil Co	$1Q	Sept. 30, 26	122,200	53¾	56¼	53¾	55½	+1⅝
250	225	.....	.....	$	45,942,800	$100	Mexican Petroleum	$3Q	Oct. 20, 26	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....		12,000,000	100	do pfd	$2Q	Oct. 20, 26	.....	.....	.....	.....	.....	.....
22½	20	13¾	6	(sh)	945,939	N.P.	Mexican Seaboard	.....	Nov. 15, 24	10,500	8	8¼	7⅛	8	0
38	25¾	37	27½	(sh)	1,357,800	N.P.	Mid-Continent Petroleum	.....	Aug. 1, 23	20,600	30	31⅞	30	31	+1
94¼	83	102½	90	$	6,718,000	$100	do pfd	$1¾Q	Dec. 1, 26	800	101¼	*102½	101¼	102	+ ¾
3¼	⅝	2½	¾		25,415,540	10	Middle States	.....	July 1, 23	8,700	⅞	⅞	¾	⅞	0
1½	1½	1⅛	½		4,384,680	.....	do ctfs	.....	.....	8,700	½	⅝	½	½	0
78½	51⅝	83¼	1	(sh)	3,500,000	N.P.	Pacific Oil	.....	Jan. 20, 26	7,300	1⅝	1⅝	1½	1½	0
83⅞	59½	76½	56⅛	$	48,307,400	$ 50	Pan American P. & T.	$1.50Q	Oct. 20, 26	800	62¼	64	61¼	64	+3
84½	60⅛	78¾	56⅞		91,025,100	50	do B	$1.50Q	Oct. 20, 26	54,200	60¾	64¾	60⅝	63¾	+3⅛
49¾	37¼	46	30	(sh)	400,000	N.P.	Pan American Western B	50cQ	Oct. 30, 26	5,100	31½	34⅜	31⅜	33½	+1¾
6¼	2¼	32	4½	(sh)	198,770	N.P.	Panhandle P. & R	.....	.....	18,200	16½	17⅜	16	16	0
60½	37	99⅜	51	$	2,935,200	$100	do pfd	.....	July 2, 23	100	72	72	72	72	—3
47⅛	36¼	56⅝	40	(sh)	2,406,692	N.P.	Phillips Petroleum	75cQ	Oct. 1, 26	245,900	53¾	*56⅝	53½	55⅛	+1⅝
3½	1¼	1⅞	½	$	29,622,925	$ 25	Pierce Oil Corp	.....	.....	3,200	¾	⅞	¾	¾	— ⅛
40	20¼	27⅛	11⅝		15,000,000	100	do pfd	.....	Feb. 1, 22	700	17	17½	17	17⅛	+ ⅛
8¼	4½	7	2½	(sh)	2,500,000	N.P.	Pierce Petroleum	.....	.....	14,000	3½	3¾	3¼	3½	0
32⅝	12½	20⅞	11	$	11,467,850	$ 50	Producers & Refiners	.....	Sept. 15, 23	12,500	17¼	20	16¾	19¼	+1¾
47⅝	27	41¾	30¾		2,845,350	50	do pfd	.....	May 1, 25	300	38⅜	38⅜	38⅜	38⅜	— ⅛
33¾	25⅛	31	25¼		75,959,250	25	Pure Oil Co	37½cQ	Dec. 1, 26	28,600	26¼	27⅞	26	27¼	+1⅛
108½	103	112¾	106		13,000,000	100	do 8% pfd	$2Q	Oct. 1, 26	1,000	111	111	111	111	— ⅛
57⅜	48¼	57⅜	47⅜	(sh)	691,922	13.40	Royal Dutch, N. Y. shares	$1.739	Aug. 2, 26	4,400	49	49¼	48¾	49¼	— ¼
49	39½	48⅝	40¾	(sh)	93,345	£2	Shell Transport & T	$1.21	July 24, 26	1,800	43⅝	43⅝	43	43	— ½
28⅜	21⅝	30⅞	24	(sh)	10,000,000	N.P.	Shell Union Oil	35cQ	Sept. 30, 26	20,500	30⅛	30½	29¾	30¼	— ⅜
106½	99½	114	103	$	20,000,000	$100	do pfd	$1½Q	Nov. 15, 26	400	107¾	108⅞	107¾	108⅞	+1¾
28½	17¾	28⅝	15⅞		7,207,620	10	Simms Petroleum	50cS.A.	July 1, 26	55,700	18⅛	20¼	18⅛	19½	+1¼
24⅞	17	24⅞	16¾	(sh)	4,489,887	N P.	Sinclair Consolidated	.....	May 31, 24	65,300	17¼	20⅛	17⅜	19½	+2⅜
94⅛	78¾	99½	90	$	17,852,200	$100	do pfd	$2Q	Nov. 15, 26	500	94½	97	94½	97	+2¾
32½	21¾	36⅞	26⅝		23,988,590	25	Skelly Oil Co	50cQ	Sept. 15, 26	24,300	33⅝	35	33½	34⅜	+ ¾
.....	.....	63¾	52⅝	(sh)	13,016,434	N.P.	S. O. California	50cQ	Sept. 15, 26	50,000	57⅞	58⅞	57⅝	58½	+ ½
47½	38⅜	46⅜	37½		515,109,675	25	S. O. New Jersey	25cQ	Sept. 15, 26	85,500	38	39¼	38	38½	+ ⅝
119	116¼	119⅝	115		199,972,900	100	do pfd	$1¾Q	Sept. 15, 26	17,300	115¼	115¼	†115	115⅛	— ¼
43⅞	38⅜	41⅝	30⅛	(sh)	1,103,931	N.P.	Sun Oil	25cQ	Sept. 15, 26	800	32	32¼	32	32	— ⅜
6⅛	2	5	1	(sh)	1,121,368	N.P.	Superior Oil Corp	.....	Dec. 20, 20	46,200	4	4¾	4	4¾	+ ¾
55	42¾	57¼	48	$	164,450,000	$ 25	The Texas Co	75cQ	Sept. 30, 26	9,600	54⅞	56½	54⅞	56½	+1
23⅜	10⅞	19½	12		8,380,340	10	Texas Pacific Coal & Oil	.....	June 30, 23	10,400	14¼	15¼	14⅛	14¾	+ ½
36⅞	30¼	39¼	27	(sh)	2,137,570	N.P.	Tide Water Oil Co	37½c	Sept. 30, 26	1,400	27	29⅛	†27	29⅛	+ ⅛
101	99	103	87¼	$	20,672,900	$100	do 5% pfd	$1.25Q	Nov. 15, 26	1,000	90	90	89⅛	90	+1½
5⅞	3½	5½	3	(sh)	3,742,029	N.P.	Transcontinental Oil	.....	.....	11,000	4	4	3¾	4	— ⅛
43⅜	33	58¾	37¼	$	40,480,800	$ 25	Union Oil of California	50cQ	Nov. 10, 26	14,100	54	54½	52¾	53½	+1
134	96¼	120	80		24,423,800	100	Union Tank Car Co	$1¼Q	Dec. 1, 26	3,700	112¼	119½	112	118	+5
117½	113¼	118	113¼		12,000,000	100	do pfd	$1¾Q	Dec. 1, 26	100	116½	116½	116½	116½	0
31¾	25½	29¼	25⅛	(sh)	490,000	N.P.	White Eagle Oil & Refining	50cQ	Oct. 20, 26	1,200	25¾	26	25⅝	25⅞	+ ⅛

*New High †New Low x Ex-Dividend Total Sales 1,268,600

Pittsburgh Stock Exchange

1925 High	1925 Low	1926 High	1926 Low	Par Value	Stocks	Transactions Week Ended Dec. 3 Sales	First	High	Low	Last	Ch'ge
.....	.....	8½	6⅝	N.P.	Andes Petroleum	.....	.....	.....	.....	.....	.....
8¼	5¼	8½	5¾	$10	Arkansas Nat. Gas	7,895	7⅝	8⅛	7½	7¾	+ ¼
.....	.....	90	79¾	$100	Columbia Gas (w.i.)	139	87¾	*90	87⅜	90	+2½
.....	.....	101	95	$100	do pfd. w.i.	138	100½	*101	100¼	101	+ ½
18	14½	17	12½	$10	Devonian Oil	267	15¼	15¾	x14½	15	— ¼
112⅝	105⅛	116½	112	$100	Duquesne Lt. 7s pfd	20	115½	115½	115½	115½	— ⅜
.....	.....	10	5⅛	N.P.	Houston Gulf Gas	2,460	5¼	6⅝	5¼	6⅜	+1⅛
.....	.....	46	39	25	Lone Star Gas Corp	5,078	45⅜	45⅝	44¾	44¾	— ½
37½	31	46⅝	33⅛	25	Ohio Fuel Corp	†90	45⅝	*46⅜	45⅝	46⅜	+1⅛
.....	.....	47½	42	....	do ctfs. of deposit	†590	45½	*47¼	45½	47¼	+1⅝
.....	.....	6¾	5	....	Ohio Oil & Gas	75	6¾	*6¾	6¾	6¾	+ ¾
34	26	34	28	25	Oklahoma Nat. Gas	.....	.....	.....	.....	.....	.....
.....	.....	21	19¼	....	do ctfs. of deposit	4,930	19¾	*21	19¾	20½	+ ½
8¾	5	5⅝	3⅛	5	Pittsburgh O. & G	.....	.....	.....	.....	.....	.....
9⅝	6	10	7½	10	Salt Creek Cons	60	8	8	7⅞	7⅞	— ⅛
13¾	8½	27	8	10	Tidal Osage	1,540	19½	22	19½	21	+1
.....	.....	43½	40	N.P.	Waverly Oil Wks. "A"	1,235	42	*43½	42	43½	+1½

Pittsburgh Curb Market

1925 High	1925 Low	1926 High	1926 Low	Par Value	Stocks	Transactions Week Ended Dec. 3 Sales	First	High	Low	Last	Ch'ge
2½	.60	3⅜	2½	$ 5	Colombia Synd	.....	.....	.....	.....	.....	.....
.60	.15	.20	.06	5	Duquesne Oil	1,350	.20	.20	.20	.20	+ .10
9	5½	22	22	10	Forest Oil	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	....	Guffey-Gillespie Oil	.....	.....	.....	.....	.....	.....
32⅝	64	91½	85	25	Gulf Oil Corp	.....	.....	.....	.....	.....	.....
.....	.....	79	79	100	Houston Gulf pfd	.....	.....	.....	.....	.....	.....
12½	3¼	12	7½	N.P.	Leonard Oil & Dvlp	.....	.....	.....	.....	.....	.....
.....	.....	1⅝	1⅜	N.P.	Mountain & Gulf	.....	.....	.....	.....	.....	.....
.....	.....	30¼	29	....	Oklahoma Gas	42	29½	29½	29½	29½	— ½
.47	.20	2	.15	10	Omar O. & G	15,525	1.80	*2	1	1.35	—.30
.....	.....	2	1¾	5	Pittsburgh Oil Dev	.....	.....	.....	.....	.....	.....
27½	25	33½	20	10	Plymouth Oil	260	27½	28	27½	28	+ ¾
7	3	5½	3	5	States Oil	.....	.....	.....	.....	.....	.....
4	1⅞	3½	2	$ 1	Texon Oil & Land	300	2⅞	2⅞	2⅞	2⅞	+ 1/16
.....	9	25¾	8	10	TidalOsage(non-voting)	100	18½	18½	18½	18½	0

*New High †New Low xEx Dividend ‡Ex-Rights

NEW YORK BONDS

Week Ending Dec. 2

	High	Low	Last	Ch'ge
Amer. Rep. Deb. 6s	99¼	99	99	0
Assoc. Oil gold 6s	103	102½	103	+ ½
Atl. Gulf Refining 5s	70	69⅝	69¾	— ¼
Atlantic Refg. deb. 5s	101	100½	101	+ ½
Barnsdall Corp. sf 6s	100	98⅞	100	+ ⅛
Cal. Petrol. sf 6½s	104	103¾	103¾	0
Cal. Petrol. cor. 5½s	100⅞	99	100¾	+ ⅝
Empire Gas & Fuel 7½s	105⅜	104¼	105⅜	+1⅛
Empire Gas & Fuel 6½s	100½	98⅞	99⅞	+ ⅛
Gen. Asphalt 6s	110	108	108	— ½
Gen. Petroleum 5s	103	101¼	101½	+ ⅛
Humble Oil & Refg. 5½s	102⅝	102⅛	102½	0
Mid-Cont. Pet. 6½s	105	104¾	104¾	0
Pan-Amer. P & T 7s	105¼	105	105	0
Pan-Amer. P & T 6s	105½	104	105½	+1½
Pierce Oil deb 8s	103¼	102¼	103¼	+1¼
Prod. & Refnrs. 8s	111	111	111	0
Prod. & Refnrs. 8s with w.i.	111⅝	111⅛	111⅛	0
Simms Pet. cvt. 6s	101¼	101⅛	101¼	— ¼
Sinclair Con. Oil Col. 7s	97¾	96½	97¾	+ ½
Sinclair Con. Oil Con. 6½s	92½	91¾	92½	+ ½
Sinclair Con. Oil 6s	100½	99½	100¼	+ ½
Sinclair Crude Oil 6s	100⅞	100⅝	100¾	0
Sinclair Pipe Line sf 5s	92¾	92¼	92⅛	+ ⅛
Superior Oil 7s	100	100	100	0
Union Oil of Cal. 6s-A	107½	107¼	107¼	— ¼
Union Oil of Cal. 5s-C	99⅛	98½	99	+ ¼

Union Tank Car to Pay Stock

CHICAGO, Dec. 4.—Union Tank Car Co. has declared a 25 per cent stock dividend payable Dec. 28 to stock of Dec. 13 record. Stockholders recently authorized an increase in the capital stock from $25,000,000 to $40,000,000. The company on Dec. 1 retired its preferred stock.

Standard Oil Stock Traded in New York

1925 High	1925 Low	1926 High	1926 Low		Outstanding Capital	Par Value	Stocks	Div. Rate	Last Paid	Transactions Week Ended Dec. 3 Sales	First	High	Low	Last	Ch'ge
26¾	17¼	21	16⅜	£	4,000,000	£1	Anglo American	60¾cS.A.	May 27, 26	.....	.....	.....	.....	.....	.....
.....	.....	20¼	16½		.....	£1	do ctfs non-votg	.....	.....	100	18⅞	18⅞	18⅞	18⅞	— ¼
4¼	1¾	2¼	1¾	(sh)	500,000	N.P.	Atlantic Lobos	.....	.....	.....	.....	.....	.....	.....	.....
12¾	8	5	3⅝	$	10,000,000	$10	do pfd	.....	.....	400	4¾	4⅞	4¾	4⅞	+ ⅛
240	205	301	226		1,000,000	100	Borne Scrymser	$4	S.A. Oct. 15, 26	.....	.....	.....	.....	.....	.....
.....	.....	70	49		.....	....	do new	.....	.....	50	49	49	†49	49	—20
72	53½	59½	42		10,000,000	50	Buckeye Pipe Line	$1	Q Sept. 15, 26	500	44¼	46	44¼	45¾	+1¾
74	48½	82¼	65		3,000,000	25	Chesebrough Mfg	75c	Q Sept. 30, 26	300	78	78	78	78	—1
115	110	.....	.....		1,000,000	100	do pfd	$1¾	Q Sept. 30, 26	.....	.....	.....	.....	.....	.....
31½	21¾	25¾	17⅝		34,914,280	10	Continental Oil	25c	Q Sept. 15, 26	11,100	20¼	20⅜	19⅞	20¼	— ⅛
17½	10	17	13¼		1,500,000	25	Crescent Pipe Line	.....	Sept. 15, 23	200	15	15	15	15	— ⅝
156	132	137	102		3,000,000	100	Cumberland Pipe Line	$3	Q Sept. 15, 26	110	111	111	x104	104	—4
96	61	63¾	43		5,000,000	100	Eureka Pipe Line	$1	Q Nov. 1, 26	500	46½	48½	46¼	48½	+1½
68½	23½	32½	9¾		16,000,000	100	Galena Signal Oil	.....	June 30, 25	400	12	12½	12	12½	+ ¾
105	88	94½	85		4,000 000	100	do new pfd	.....	June 30, 26	120	45	45	45	45	—4
114	95	97½	45¾		2,000,000	100	do old pfd	.....	June 30, 26	50	45¼	45¼	45¼	45¼	—3¾
95	42¾	68¾	52		72,916,650	25	Humble Oil & Refining	30c	Q Oct. 1, 26	10,800	57⅝	59½	56⅞	59¾	+1½
154½	127	144½	128		20,000,000	100	Illinois Pipe Line	$6	S.A. June 30, 26	150	128	129	†128	128	+ ¼
39¼	27¼	39¾	31½	(sh)	6,491,852	N.P.	Imperial of Canada	25c	Q Dec. 1, 26	4,700	37¾	38	37	37⅞	+ ⅜
84	57¾	70	54¼	$	5,000,000	50	Indiana Pipe Line	$1	Q Nov. 15, 26	50	61½	61½	61½	61½	— ½
35¾	22⅛	35¼	28¾	(sh)	7,118,138	N.P.	International Petroleum	25c	Nov. 15, 26	11,200	31⅝	31⅝	31	31¼	— ¼
25¾	16½	20⅜	12½	$	6,362,500	$12½	National Transit	25c	Q Sept. 15, 26	1,400	13	13¼	12½	12⅞	— ⅛
79	49¾	51½	27⅛		5,000,000	100	New York Transit	.....	July 15, 26	50	32½	32½	32½	32½	+1
88	67½	80½	64		4,000,000	100	Northern Pipe Line	$3	S.A. July 1, 26	50	74¾	74¾	74¾	74¾	— ¼
75⅛	60¼	67¾	55¾		60,000,000	25	Ohio Oil Co	50c	Q Sept. 15, 26	3,500	58¾	61½	58⅞	61	+2½
44½	19	24¾	15		10,000,000	25	Penn Mex Fuel	.....	May 21, 25	400	19	19	16¾	16¾	—3¼
65⅞	45⅞	60¾	48		60,000,000	25	Prairie Oil & Gas	50c	Q Nov. 30, 26	10,000	49½	50¾	49⅛	50¾	+ ¾
129¾	106	127½	122¾		81,000,000	100	Prairie Pipe Line	$2	Q Oct. 30, 26	450	125	125	124½	124½	— ¼
254	200	220	184½		4,000,000	100	Solar Refining Co	$5	S.A. June 19, 26	70	192	196	x191	196	+2
103	63	74½	22½		10,000,000	100	Southern Pipe Line Co	.....	Mar. 1, 26	100	22½	22½	†22½	22½	— ⅞
47½	45	50	34½		20,000,000	25	South Penn Oil Co	37½cQ	Sept. 30, 26	2,000	36¾	39¾	36¾	38¾	+2¾
84	50	56½	49		3,500,000	100	South West Pa. Pipe Line	$1	Q Oct. 1, 26	50	55¼	55½	55¼	55¼	—1¾
70¾	59½	70½	60½	$	223,756,258	$25	S. O. Indiana	62½cQ	Sept. 15, 26	24,700	64¾	65½	64¾	65½	+ ⅞
46	30⅛	36½	16¼		8,000,000	25	S. O. Kansas	.....	June 16, 24	2,900	18⅞	21	18⅞	21	+2¾
137	114¾	134¾	108		16,864,434	25	S. O. Kentucky	$1	Q Sept. 30, 26	200	118¼	119¾	117¼	119	+1
.....	.....	51⅜	42		4,518,000	25	S. O. Nebraska	63cQ	Sept. 20, 26	600	47⅜	48	47	48	+ ½
48⅝	40¾	47¼	30⅜		358,102,000	25	S. O. New York	40cQ	Sept. 15, 26	34,900	31⅝	33	31¼	32⅞	+1⅜
369	338	362	288		14,000,000	100	S. O. Ohio	$2½Q	Oct. 1, 26	1,550	298½	358	298½	349	+51½
123	116	122	117		7,000,000	100	do pfd	$1¾Q	Dec. 1, 26	100	118	118	118	118	0
27	12	23	15¼		1,722,931	25	Swan-Finch Co	.....	Nov. 1, 19	.....	.....	.....	.....	.....	.....
109⅛	80⅛	112	90¼		61,919,950	25	Vacuum Oil Co	50c	Sept. 20, 26	2,600	97	97½	x 94½	94½	+2¼

NEW YORK CURB BONDS

Week Ending Dec. 3

	High	Low	Last	Ch'ge
Beacon Oil 6s '36	101¼	101	101¼	0
Cities Serv. 6s '66	97⅛	96⅞	97	+ ⅛
Cities Serv. 7s "B" '66	221	221	221	+15
Cities Serv. 7s "D" '66	122½	122¼	122¼	+ ⅛
Cities Serv. 8s "E" '66	130	130	130	0
Galena S. O. 7s '30	88	87½	87½	— ½
General Pet. 6s '26	101½	101¼	101⅜	0
Gulf Oil 5s '37	100¾	100½	100¾	+ ⅜
Indepen. Oil 6½s '31	100	99⅜	100	+ ¾
Pan Amer. Pet. 6s '40	99½	98¾	99½	+ ½
Pure Oil 6½s '33	103½	103½	103½	— ¼
Richfield Oil 6s wi '41	99	99	99	0
S O N J 5s wi	102¾	101¾	102	0
S O N Y 6½s '38	105½	105¼	105½	+ ¼
SO N Y 4½s wi	98	97¾	98	0
Sun Oil 5½s '39	100	99½	100	0
Trans. Cont. Oil 7s '30	96¾	96	96¾	0
United Oil Prod. 8s '31	40	38⅝	40	+1

Oil Dividends

	Amt.	Payable	Stock of Record
Ark. Nat. Gas. q	12c	Jan. 1	Dec. 10
Bethany Oil special	$1.25	Dec. 1	Nov. 25
Big Lake	27½c	Dec. 18	Dec. 14
British-Amer. q	62½c	Jan. 2	Dec. 14
do extra	50c	Jan. 2	Dec. 14
Plymouth Oil	75c	Dec. 20	Dec. 14
Pure Oil 5¼ pfd. q	$1.25	Jan. 1	Dec. 10
do 6 pfd. q	$1.50	Jan. 1	Dec. 10
do 8 pfd. q	$2	Jan. 1	Dec. 10
South Penn q	50c	Dec. 31	Dec. 14
S. W. Pa. Pipe Lines q	$1	Dec. 31	Dec. 15
S. O. Kentucky q	$1	Dec. 31	Dec. 15
Tide Water-Assoc. pfd. q	$1.50	Jan. 1	Dec. 6
Union Tank Car stock	25%	Dec. 28	Dec. 13
Warner-Quinlan q	50c	Jan. 3	Dec. 15
Woodley Pet. q	15c	Dec. 31	Dec. 15

Cleveland Stock Market

Dec. 3

	Par	Bid	Asked	Last Sale
Canfield Oil Co	$100	.....	.....	110
do pfd	100	.....	.....	95
Fred G. Clark Co	10	3¼	3½	3⅝
National Refining Co	25	40	40½	41
do pfd	100	130	.....	132
Paragon Refining Co	25	7	7¼	7⅜
do pfd	100	65	.....	70

xEx-dividend

New York Curb Market

1925 High	1925 Low	1926 High	1926 Low	Par Value	Stocks	Transactions week ended Dec. 3 Sales	First	High	Low	Last	Ch'ge
11½	2¼	14½	4	$ 5	Amer. Maracaibo	26,400	6¾	6⅞	6¼	6¾	— ⅛
8¾	5	8¾	5¾	$10	Arkansas Nat. Gas.	2,000	7¾	8⅛	7¾	7¾	0
.....	.....	19¾	14½	N.P.	Beacon Oil	4,600	18⅜	18½	17⅞	18	— ⅛
47½	38	.....	.....	$25	British-American	1,600	69	77¼	69	76¼	+7
10¾	2¾	23⅝	9¼	25c	Carib. Syndicate	28,100	23⅛	23⅜	21⅝	22⅜	— ⅝
48	35	49¾	37½	$20	Cities Service	13,400	49	*49⅜	49	49⅜	+ ⅛
85¾	80¼	92½	82¾	100	do pfd	3,800	92½	92½	92¼	92½	0
8	7¼	8¼	7⅜	10	do pfd. B	.....	.....	.....	.....	.....	.....
21¾	17½	24½	19	10	do bankers' sh	100	24½	24½	24½	24½	0
2¾	.60	3½	1¾	N.P.	Colombia Syndicate	7,900	2⅛	2½	2⅛	2½	+ 1/16
15	8¼	16	10	N.P.	Creole Syndicate	45,200	13⅞	14¼	13¾	14¼	+ ⅜
12¾	5	7¾	1⅝	N.P.	Crown Central	4,000	1⅞	1⅞	1¾	1¾	— ⅛
7	2	4	1⅛	N.P.	Derby Oil & Ref	.....	.....	.....	.....	.....	.....
27	10½	19	13	N.P.	do pfd	100	14	14	14	14	0
.....	.....	2¾	.60	.....	Euclid Oil	8,300	85	85	80	80	—5
6	1⅜	7½	2½	N.P.	Gibson Oil	71,400	3	4¼	3	3⅞	+ ¾
3¾	1⅜	2	.65	N.P.	Gilliland v.t.c	2,000	85	1⅜	85	1	+ ⅛
98¼	63½	95	82	$25	Gulf Oil Corp	8,000	90¾	93¾	90¼	93⅛	+3⅛
5⅞	2¼	4	1	N.P.	Kirby Petroleum	3,100	1¾	1¾	1½	1½	— ¼
13	6	12¼	5¾	N.P.	Leonard Oil & Dev	700	7¼	7½	7¼	7⅜	— ⅛
25⅞	18	25¾	20	N.P.	Lion Oil Refining	10,300	23⅛	25	23	24⅞	+1⅝
.....	.....	46	31½	$25	Lone Star Gas	1,100	45⅛	45⅞	45	45⅞	+1¾
4¼	1¾	3¾	1½	N.P.	Marland of Mexico	.....	.....	.....	.....	.....	.....
5¾	.56	5½	1⅞	$10	Mexican-Panuco	41,000	2⅞	3⅜	2¾	3⅜	+ ¾
2	1	1¾	1¼	1	Mountain & Gulf	1,100	1⅜	1½	1⅜	1⅜	0
26¼	18¾	26	22½	10	Mountain Prod	7,800	25⅜	25⅝	25⅜	25⅝	0
6¾	3⅝	6¾	5	5	New Bradford	1,000	5¼	5⅜	5¼	5¼	— ⅛
24¾	16¼	11¾	2	10	New England Fuel	.....	.....	.....	.....	.....	.....
19¾	6¼	17	9⅜	1	New Mex. & Ariz	4,300	10	12⅝	10	12½	+2½
12½	8¼	17	8	25	New York Oil	200	10	10	10	10	0
37	14	36	34¼	25	Ohio Fuel Corp	.....	.....	.....	.....	.....	.....
.....	.....	9⅞	6	....	Pandem	10,400	8¾	9½	8¾	9½	+ ¾
2½	.90	2¾	.20	N.P.	Peer Oil Corp	3,000	26	26	25	25	—1
28¼	16	22¾	12	$10	Pennok Oil	200	13¼	13⅞	13¼	13⅞	— ¼
44½	16	38	14⅜	25	Red Bank Oil	100	22	22	22	22	—1
33½	19	28¾	12	N.P.	Reiter-Foster	6,900	18⅜	18½	17¼	17½	—1
.....	.....	27½	22	$25	Richfield Oil w.i	1,500	22½	23	22	23	+ ⅞
9½	3½	7¾	4½	N.P.	Ryan Consolidated	300	4½	4½	4½	4½	— ⅛
9¾	6¾	10	7½	$10	Salt Creek Cons	100	7⅜	7⅜	7⅜	7⅜	0
35	24	36	26⅞	10	Salt Creek Prod	5,700	31¼	31¼	30¾	31⅜	— ⅛
3⅞	1	4	1⅜	5	Savoy Oil	300	3¼	3¼	3	3	0
13¾	9	27	7⅜	10	Tidal Osage	1,800	19½	21½	19	20½	+ ⅞
10⅜	8	25¾	8¼	10	do non-votng	4,200	17½	19⅞	17½	19¼	+1¼
.....	.....	27	20⅞	N.P.	Tide Water Assoc	8,600	22	22⅞	21⅜	22⅞	+ ⅜
.....	.....	99¼	95½	100	do pfd	2,200	96¾	96¾	96¼	96⅜	— ⅛
4⅞	1¾	8	4¼	5	Venezuelan Pet	14,200	6⅞	7⅜	6¾	7¼	+ ½
.....	.....	29¾	23½	N.P.	Warner-Quinlan	500	25¾	26	25½	25½	— ⅝
31¼	22⅛	36⅛	22	N.P.	Wilcox O. & G. new	1,000	27¼	27½	27	27	0
7	3⅞	9½	4⅜	$ 1	Woodley Petroleum	500	6¾	7½	6¾	7½	+ ¾

*New High †New Low xEx-Dividend.

(Continued from page 122

is rich in gasoline content, while Seal Beach gas has a content close to two gallons to the 1000 cu. ft. The gasoline content of the gas at Ventura Avenue is getting better, and the yield of natural gasoline plants in this field has been greatly increased.

Within another three weeks another plant will be in operation at Seal Beach, making two portables and a permanent plant in this field. The increased natural gasoline output serves to supply the ordinary demand, even taking care of the increased demand in the blending of higher gravity winter gasolines now on sale by several of the larger companies. Spot prices continue around 10½ to 11½ cents.

Coupon Book Price Firm During Mankato War

CHICAGO, Dec. 4.—Standard Oil Co. of Indiana did not actually sell any gasoline coupon books for less than their face value during the recent price disturbance in Mankato, Minn., although the firm's agent there was given authority to do so. This announcement was made by Standard officials here late in the week.

On page 38 of the Dec. 1 issue of N. P. N., in a mention of the Mankato price war, it was published that Standard of Indiana had authorized their local agent to sell coupon books for 10 per cent discount which, in relation to the Mankato price level, meant the filling station price might have been reduced thus slightly below the tank wagon price.

Prairie P. L. Shipments Fall in November

TULSA, Dec. 6.—Shipments of the Prairie Pipe Line Co. in November totaled 4,082,008 barrels, a decrease of 108,369 barrels as compared with the October report. This decrease was caused by the difference of one day in length of the two months, as daily average shipments in November were 136,067 barrels, a gain of 248 barrels over the preceding month.

Prairie Pipe Line Co. shipments since the beginning of the current year have been as follows:

Month	Shipments	Daily Average
January	4,187,390	135,077
February	4,071,405	145,407
March	4,588,038	148,001
April	4,332,972	144,432
May	4,542,260	146,525
June	4,215,416	140,514
July	4,234,294	136,590
August	4,005,485	129,209
September	3,906,979	130,233
October	4,190,377	135,819
November	4,082,008	136,067

Beacon Oil Co.—Sixty acres bought on Connecticut river below Hartford terminal. Tanks and docks are to be built.

THE OIL INDUSTRY EXCHANGE

Positions Wanted

YOUNG MAN WITH FIFTEEN YEARS EXPERIENCE buying and selling petroleum products, constructing and managing filling stations, and bulk sales, desires connection with substantial oil company, willing to start at moderate salary.

Box 731

Situations Open

SALESMAN WANTED

Business getter acquainted with Michigan jobbers, to sell lubricating oils in barrels and tank cars for old established company. Give full particulars in reply.

Box 741

OIL SALESMAN for Automobile and Industrial Lubrication: Who is selling carloads to jobbers, in protected territories and can develop to territorial manager. Write in confidence, salary expected, experience, age and amount of last year's sales. Appointment by mail only.

Panhard Oil Corporation, 122 Greenwich Street, New York City.

INDUSTRIAL LUBRICATION ENGINEER

A major oil company has an opportunity for a wide-awake, experienced lubrication engineer in their industrial oil division for New Jersey and Pennsylvania territories. Answer by letter giving full details to

Lubricating Engineer,
National Petroleum News
342 Madison Ave.
New York City

Miscellaneous

WHAT IT COSTS

For "Position Wanted" advertisements—5 cents per word. Minimum cost $1.00. All other classified advertising—10 cents per word. Minimum cost $3.00. Advertisements set in special type or with border—$4.00 per column inch. Copy must reach us not later than Friday preceding date of issue.

All advertisements carried on this page are payable in advance.

Advertisers having box numbers should be addressed in care of National Petroleum News, 817 Huron road, Cleveland, Ohio, unless otherwise specified.

Business Opportunities

INVENTORS—Am in touch with hundreds of moneyed men and manufacturers who wish to buy good inventions. Write Hartley, 38 Court St., Bangor, Maine.

PETROLEUM PRODUCTS BOUGHT ON COMMISSION

Make this office your Tulsa buying office on a commission basis.

Let's Exchange References

DALE W. MOORE

532-533 Mayo Bldg., Tulsa, Okla.
Telephones: 3-4177 and 3-4178
L. D. 136

BULK AND SERVICE STATIONS

If it is in regard to established marketing facilities, we can render you the same valuable service we have others, regardless of whether you want to buy or sell, as we make a specialty of dealing in utilities of this nature.
Correspondence confidential if so requested.

RIGHT NOW

We have a splendid layout in southeastern Kansas, earning money, well established, yet can be bought at less than cost to duplicate. We also have other oil jobbing layouts elsewhere.

REFINERS CONSOLIDATED SALES CO.
Wichita, Kansas

Equipment Wanted

ORIFICE METER GAUGE

with differential and static records on same chart. Capacity 50 inches water and 250 lb. pressure. Must be in good condition.

The Sloan and Zook Company,
Bradford, Pa.

For Sale

NEW YORK WATERFRONT PROPERTY FOR SALE for the storage of gasoline and all other petroleum products. 1000 feet from New York City line; one-half cent freight from New York Harbor Terminals.
Address Westchester Terminal Company, Inc. 707 S. Columbus Ave., Mount Vernon, N. Y.

BIG RETAIL GAS AND OIL BUSINESS FOR SALE

Location, Asheville, Ohio. Property and Equipment: 2 lots on N. & W. siding, on which are four storage tanks and 2 residences; 2 lots in center of business district, on which are 2 mercantile establishments and oil station; Station at South Bloomfield on rented lot; Selden truck, 1000 gallons capacity; Sterling truck, 600 gallons capacity; Reo truck, 500 gallons capacity; 8 garage pumps and 11 country store pumps. Profitable Business, Hundreds of Regular Customers.

For further particulars address the owner, T. A. Boor, Asheville, O.

ADVERTISERS INDEX

National Petroleum News

Adamson Mfg. Co.....
Alcorn Combustion Co.....
Allison Coupon Co..... 106
Aluminum Company of America..... Insert
American Bridge Co.....
American Can Co..... 14
American Oil Corp.....
American Oil Pump & Tank Co..... 16
American Radiator Co.....
American Schaeffer & Budenberg Corp.....
American Steel Package Co.....
American Telephone and Telegraph Co..... 81
Associated Business Papers, Inc..... 100
Association of Natural Gasoline Mfg.....
Autocar Co.....
Automobile Rotary Lift Co..... 43

Barnickel & Co., Wm. S..... 75
Barnsdall Refg. Co.....
Battenfeld Grease & Oil Co..... 4
Bell Oil & Gas Co.....
Benjamin Electric Mfg. Co.....
Bennett Pumps Corp.....
Bessemer Gas Engine Co..... 84
Bethlehem Steel Co..... 102
Birmingham Machine & Foundry Co.....
Blackmer Pump Co.....
Blaw-Knox Co..... 5
Boe Mfg. Co.....
Bowser & Co., Inc., S. F.....
Braun & Co., C. F..... 71
Brookins Mfg. Co.....
Brown Sheet Iron & Steel Co..... 116
Buckeye Boiler Co.....
Buckeye Iron & Brass Works..... 103
Budd Wheel Co.....
Buffalo Meter Co..... 80
Burrell Co., Geo. A..... 86
Butler Mfg. Co.....

Cameron, A. S. Steam Pump Works.....
(Ingersoll-Rand Company).....
Campbell, J. A..... 59
Canfield Oil Co., Cleveland..... 66-67
Central Commercial Co.....
Champion Pneumatic Mach. Co.....
Champlin Refining Co.....
Chapman Valve Mfg. Co.....
Chestnut & Smith Corp.....
Chicago Bridge & Iron Works..... 55
Chicago Nipple Mfg. Co.....
Chicago Tubing & Braiding Co.....
Cincinnati Advertising Products Co.....
Clark Co., Fred G.....
Classified Advertising Section..... 127
Cleveland Steel Barrel Co..... 11
Columbian Steel Tank Co.....
Continental Ref. Co.....
Continental Supply Co..... 76
Correct Measure Co.....
Crane Co.....
Crown Central Petroleum Corp.....
Crystal Oil Refg. Corp.....
Curtis Pneumatic Machinery Co.....

Dale Oil & Refg. Co.....
Damascus Manufacturing Corp.....
Davis Welding & Mfg. Co.....
Dayton Air Compressor.....
Dayton Pump & Mfg. Co..... 98-99
Deepwater Oil Refineries..... 15
Dempster Mill Mfg. Co.....
Derby Oil & Refg. Corp., The.....
Des Moines Foundry & Machine Co.....
Draper Mfg. Co..... Inside Back Cover
Dunning Compressor Co.....
Dunn Painting Machine Co.....
Du Pont de Nemours & Co. E. I.....

Economy Engineering Co.....
Edwards Mfg. Co..... 96
Edward Valve & Mfg. Co.....
Emerson-Scheuring Tank Co.....
Empire Oil Works, Inc.....
Empire Refineries, Inc.....
Erie Service Station Equipment Co.....
Ethyl Gasoline Corp..... 114

Fairbanks, Morse Co.....
Farrell Mfg. Co.....
Fiske Bros. Refg. Co..... 80
Flexlume Corp..... 105
Foamite-Childs Corp..... 3
Fogarty Mfg. Co., The.....
Freedom Oil Works.....
Frontier Mfg. Co.....

Gasoline Register Co.....
General American Tank Car Corp.....
General Motors Truck Co.....
Gilbert & Barker Mfg. Co..... 8-9
Globe Mfg. Co.....
Globe Oil & Refg. Co.....
Gomory, W. L.....
Goodrich Rubber Co., B. F.....
Graham Brothers.....
Graver Corp..... 1
Gray Processes Corp.....
Groetken Pump Co.....
Guarantee Liquid Measure Co..... 110
Gulf Ref. Co..... 95

Halliburton Oil Well Cementing Co.....
Handy Oiler Co.....
Hartol Products Corp..... 97
Heil Co., The..... 107
Hiergesell Brothers.....
Highland Body Mfg. Co.....
Hope Engineering & Supply Co..... 93
Hornblower & Weeks..... 116
Hughes Tool Co..... 68
Humble Oil & Refining Co..... 61
Huntley & Huntley..... 70

Illinois Glass Co.....
Imperial Oil Marketing Co.....
Independent Oil & Gas Co.....
India Tire & Rubber Co.....
Ingersoll-Rand Co.....
(A. S. Cameron Steam Pump Works).....
International Harvester Co.....
Iowa Park Producing & Refg. Co.....
Irving-Iron Works Co.....
Island Petroleum Co.....

Jenkins Bros..... 86
Johns-Manville Co., H. W.....
Johnson Fare Box Co.....

Kanotex Ref. Co.....
Kewanee Safe Co.....
Keen & Woolf Oil Co.....
Kellogg Co., M. W..... 18
Kellogg Mfg. Co.....
Kelly-Springfield Tire Co.....
Kelly-Springfield Truck & Bus Corp.....
Keystone Oil & Mfg. Co.....

Lancaster Iron Works, Inc.....
Larkin Automotive Parts Co.....
Leader Iron Works.....
Linde Air Products Co.....
Litchfield Corp.....
Louisiana Oil Refg. Co.....
Lubricating Appliance Mfg. Co. Inc.....
Luce Trunk Co..... 109
Lucey Mfg. Co.....
Ludlow Valve Mfg. Co.....
Lummus Co. The Walter E.....

Marco Light & Power Corp.....
Marland Refg. Co..... 65
Mars Co.....
Marvel Equipment Co..... 111
Mathieson Alkali Works Inc..... 91
McDonald Mfg. Co., A. Y.....
McKee & Co., Arthur G..... 63
Merco Nordstrom Valve Co.....
Merriam Co., C. & G.....
Merit Oil Equipment Co.....
Metal Hose & Tubing Co..... 7
Metal Shelter Co..... 64
Metric Metal Works..... 87
Meyercord Co.....
Miller & Co., Inc. Max B.....
Miller Sons Co., A. D.....
Milwaukee Tank Works.....
Mohawk Rubber Co.....
Moore & Kling, Inc.....
Morrison Bros.....

National Carbon Co., Inc.....
National Oil Products Co.....
National Petroleum Marketers Assn.....
National Petroleum News..... 12-104-108
National Recording Pump Co... Inside Front Cover
National Refining Co..... 109
National Tank Auditing Service, Inc.....
National Transit Pump & Machine Co..... 59
Neil & Co. Wm..... 64
North American Car Corp.....

Ohio Traffic Devices Co.....
Ohmer Fare Register Co.....
Oil Conservation Engineering Co..... 72
Oil Well Supply Co..... 39
Oxweld Acetylene Co.....

Page Steel & Wire Co.....
Pease Co., C. F.....
Peerless Stove & Mfg. Co.....
Pennsylvania Flexible Metallic Tubing Co.....
Pennsylvania Refg. Co.....
Petroleum Iron Works Co.....
Petroleum Oils Corp.....
Pforzheimer & Co., Carl H.....
Phillips Petroleum Co.....
Pittsburgh-Des Moines Steel Co.....
Pittsburgh Gasoline Pump Co.....
Pittsburgh Machine Tool Co.....
Pittsburgh Pipe Coil & Bending Co.....
Platt Co., W. C..... 118
Power Specialty Co.....
Pressed Steel Tank Co.....
Prest-O-Lite Co.....
Producers & Refiners Corp.....
Professional Card Section..... 70
Pure Oil Co..... Outside Back Cover
Pyrene Mfg. Co.....

Quaker State Oil Refg. Co.....
Quincy Compressor Co.....

Ranney Oil Mining Co..... 70
Rand McNally & Co.....
Reading Steel Castings Co., Inc.....
Rhodes Co., Jay B..... 106
Robertson Steel & Iron Co. W. F.....
Roper Corp., Geo. D.....
Roxana Petroleum Corp.....

St. Louis Can Co.....
St. Louis Steel Package Co.....
Schaeffer Bros. & Powell Mfg. Co.....
Selden Truck Corp.....
Service Station Equip. Co.....
Sharpsville Boiler Works Co.....
Shepard Corp., Arthur B..... 95
Shotwell Pump & Tank Co.....
Sinclair Refining Co..... 112
Sistersville Tank & Boiler Works.....
Skelly Oil Co.....
Smith Corp. A. O.....
Sowers Mfg. Co..... 96
Spencer Petroleum Co.....
Standard Boiler & Plate Iron..... 105
Steel Drum Accessories Corp.....
Steiner Oil Co.....
Streett & Co., Inc. J. D.....
Suender, W. Frederick..... 70
Sun Oil Company.....

Tagliabue Mfg. Co., C. J.....
Texas Company, The.....
Texas Pacific Coal & Oil Co.....
Tide Water Oil Co.....
Tokheim Oil Tank & Pump Co..... 2
Transcontinental Oil Co.....
Truscon Steel Co.....

Union Metal Mfg. Co.....
Union Tank Car Co.....
United Filters Corp..... 103
U. S. Air Compressor Co.....
United States Can Co., The.....
United States Cast Iron Pipe & Foundry Co.....
Universal Oil Products Co..... 56-57

Van Tine, C. C.....
Viking Pump Co..... 10
Vilter Mfg. Co.....
Vogt Machine Co., Henry..... 86
Volcker Mfg. Co.....

Wackman Welded Ware Co.....
Walburn Petroleum Co., Inc.....
Waverly Oil Works.....
Wayne Co.....
Westcott & Greis, Inc..... 87
Western Steel Corp.....
Wheaton Brass Works, A. W..... 23
Wheeling Steel Corp.....
White Company.....
White Eagle Oil & Refg. Co..... 102
Widdell Engineering Co., Inc..... 63
Williams Sealing Corp.....
Wilsey Tuthill Pump.....
Wilson Welder & Metals Co., Inc.....

Youngstown Boiler & Tank Co..... 6
Youngstown Welding Co., The.....